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“This book is not only the definitive account of the historical evolution of inequality in advanced economies, it is also a magisterial treatise on capitalism’s inherent dynamics. Piketty ends his book with a ringing call for the global taxation of capital. Whether or not you agree with him on the solution, this book presents a stark challenge for those who would like to save capitalism from itself.”

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PIKETTY

CAPITAL

in the
Twenty-First
Century



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CAPITAL

in the Twenty-First Century

THOMAS
PIKETTY

TRANSLATED BY ARTHUR GOLDHAMMER

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What are the grand dynamics that drive the accumulation and distribution of capital? Questions about the long-term evolution of inequality, the concentration of wealth, and the prospects for economic growth lie at the heart of political economy. But satisfactory answers have been hard to find for lack of adequate data and clear guiding theories. In *Capital in the Twenty-First Century*, Thomas Piketty analyzes a unique collection of data from twenty countries, ranging as far back as the eighteenth century, to uncover key economic and social patterns. His findings will transform debate and set the agenda for the next generation of thought about wealth and inequality.

Piketty shows that modern economic growth and the diffusion of knowledge have allowed us to avoid inequalities on the apocalyptic scale predicted by Karl Marx. But we have not modified the deep structures of capital and inequality as much as we thought in the optimistic decades following World War II. The main driver of inequality—the tendency of returns on capital to exceed the rate of economic growth—today threatens to generate extreme inequalities that stir discontent and undermine democratic values. But economic trends are not acts of God. Political action has curbed dangerous inequalities in the past, Piketty says, and may do so again.

A work of extraordinary ambition, originality, and rigor, *Capital in the Twenty-First Century* reorients our understanding of economic history and confronts us with sobering lessons for today.

Capital in the Twenty-First Century

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CAPITAL IN THE
TWENTY-FIRST
CENTURY

Thomas Piketty

Translated by Arthur Goldhammer

The Belknap Press of Harvard University Press

CAMBRIDGE, MASSACHUSETTS

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Acknowledgments

This book is based on fifteen years of research (1998–2013) devoted essentially to understanding the historical dynamics of wealth and income. Much of this research was done in collaboration with other scholars.

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The book was also deeply influenced by my historical work with Gilles Postel-Vinay and Jean-Laurent Rosenthal on Parisian estate records from the French Revolution to the present. This work helped me to understand in a more intimate and vivid way the significance of wealth and capital and the problems associated with measuring them. Above all, Gilles and Jean-Laurent taught me to appreciate the many similarities, as well as differences, between the structure of property in the period 1900–1910 and the structure of property now.

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Capital in the Twenty-First Century

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Introduction

“Social distinctions can be based only on common utility.”
—Declaration of the Rights of Man and the Citizen, article 1, 1789

The distribution of wealth is one of today’s most widely discussed and controversial issues. But what do we really know about its evolution over the long term? Do the dynamics of private capital accumulation inevitably lead to the concentration of wealth in ever fewer hands, as Karl Marx believed in the nineteenth century? Or do the balancing forces of growth, competition, and technological progress lead in later stages of development to reduced inequality and greater harmony among the classes, as Simon Kuznets thought in the twentieth century? What do we really know about how wealth and income have evolved since the eighteenth century, and what lessons can we derive from that knowledge for the century now under way?

These are the questions I attempt to answer in this book. Let me say at once that the answers contained herein are imperfect and incomplete. But they are based on much more extensive historical and comparative data than were available to previous researchers, data covering three centuries and more than twenty countries, as well as on a new theoretical framework that affords a deeper understanding of the underlying mechanisms. Modern economic growth and the diffusion of knowledge have made it possible to avoid the Marxist apocalypse but have not modified the deep structures of capital and inequality—or in any case not as much as one might have imagined in the optimistic decades following World War II. When the rate of return on capital exceeds the rate of growth of output and income, as it did in the nineteenth century and seems quite likely to do again in the twenty-first, capitalism automatically generates arbitrary and unsustainable inequalities that radically undermine the meritocratic values on which democratic societies are based. There are nevertheless ways democracy can regain control over capitalism and ensure that the general interest takes precedence over private interests, while preserving economic openness and avoiding protectionist and nationalist reactions. The policy recommendations I propose later in the book tend in this

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direction. They are based on lessons derived from historical experience, of which what follows is essentially a narrative.

A Debate without Data?

Intellectual and political debate about the distribution of wealth has long been based on an abundance of prejudice and a paucity of fact.

To be sure, it would be a mistake to underestimate the importance of the intuitive knowledge that everyone acquires about contemporary wealth and income levels, even in the absence of any theoretical framework or statistical analysis. Film and literature, nineteenth-century novels especially, are full of detailed information about the relative wealth and living standards of different social groups, and especially about the deep structure of inequality, the way it is justified, and its impact on individual lives. Indeed, the novels of Jane Austen and Honoré de Balzac paint striking portraits of the distribution of wealth in Britain and France between 1790 and 1830. Both novelists were intimately acquainted with the hierarchy of wealth in their respective societies. They grasped the hidden contours of wealth and its inevitable implications for the lives of men and women, including their marital strategies and personal hopes and disappointments. These and other novelists depicted the effects of inequality with a verisimilitude and evocative power that no statistical or theoretical analysis can match.

Indeed, the distribution of wealth is too important an issue to be left to economists, sociologists, historians, and philosophers. It is of interest to everyone, and that is a good thing. The concrete, physical reality of inequality is visible to the naked eye and naturally inspires sharp but contradictory political judgments. Peasant and noble, worker and factory owner, waiter and banker: each has his or her own unique vantage point and sees important aspects of how other people live and what relations of power and domination exist between social groups, and these observations shape each person's judgment of what is and is not just. Hence there will always be a fundamentally subjective and psychological dimension to inequality, which inevitably gives rise to political conflict that no purportedly scientific analysis can alleviate. Democracy will never be supplanted by a republic of experts—and that is a very good thing.

Nevertheless, the distribution question also deserves to be studied in a systematic and methodical fashion. Without precisely defined sources, meth-

INTRODUCTION

ods, and concepts, it is possible to see everything and its opposite. Some people believe that inequality is always increasing and that the world is by definition always becoming more unjust. Others believe that inequality is naturally decreasing, or that harmony comes about automatically, and that in any case nothing should be done that might risk disturbing this happy equilibrium. Given this dialogue of the deaf, in which each camp justifies its own intellectual laziness by pointing to the laziness of the other, there is a role for research that is at least systematic and methodical if not fully scientific. Expert analysis will never put an end to the violent political conflict that inequality inevitably instigates. Social scientific research is and always will be tentative and imperfect. It does not claim to transform economics, sociology, and history into exact sciences. But by patiently searching for facts and patterns and calmly analyzing the economic, social, and political mechanisms that might explain them, it can inform democratic debate and focus attention on the right questions. It can help to redefine the terms of debate, unmask certain preconceived or fraudulent notions, and subject all positions to constant critical scrutiny. In my view, this is the role that intellectuals, including social scientists, should play, as citizens like any other but with the good fortune to have more time than others to devote themselves to study (and even to be paid for it—a signal privilege).

There is no escaping the fact, however, that social science research on the distribution of wealth was for a long time based on a relatively limited set of firmly established facts together with a wide variety of purely theoretical speculations. Before turning in greater detail to the sources I tried to assemble in preparation for writing this book, I want to give a quick historical overview of previous thinking about these issues.

Malthus, Young, and the French Revolution

When classical political economy was born in England and France in the late eighteenth and early nineteenth century, the issue of distribution was already one of the key questions. Everyone realized that radical transformations were under way, precipitated by sustained demographic growth—a previously unknown phenomenon—coupled with a rural exodus and the advent of the Industrial Revolution. How would these upheavals affect the distribution of wealth, the social structure, and the political equilibrium of European society?

For Thomas Malthus, who in 1798 published his *Essay on the Principle of Population*, there could be no doubt: the primary threat was overpopulation.¹ Although his sources were thin, he made the best he could of them. One particularly important influence was the travel diary published by Arthur Young, an English agronomist who traveled extensively in France, from Calais to the Pyrenees and from Brittany to Franche-Comté, in 1787–1788, on the eve of the Revolution. Young wrote of the poverty of the French countryside.

His vivid essay was by no means totally inaccurate. France at that time was by far the most populous country in Europe and therefore an ideal place to observe. The kingdom could already boast of a population of 20 million in 1700, compared to only 8 million for Great Britain (and 5 million for England alone). The French population increased steadily throughout the eighteenth century, from the end of Louis XIV's reign to the demise of Louis XVI, and by 1780 was close to 30 million. There is every reason to believe that this unprecedentedly rapid population growth contributed to a stagnation of agricultural wages and an increase in land rents in the decades prior to the explosion of 1789. Although this demographic shift was not the sole cause of the French Revolution, it clearly contributed to the growing unpopularity of the aristocracy and the existing political regime.

Nevertheless, Young's account, published in 1792, also bears the traces of nationalist prejudice and misleading comparison. The great agronomist found the inns in which he stayed thoroughly disagreeable and disliked the manners of the women who waited on him. Although many of his observations were banal and anecdotal, he believed he could derive universal consequences from them. He was mainly worried that the mass poverty he witnessed would lead to political upheaval. In particular, he was convinced that only the English political system, with separate houses of Parliament for aristocrats and commoners and veto power for the nobility, could allow for harmonious and peaceful development led by responsible people. He was convinced that France was headed for ruin when it decided in 1789–1790 to allow both aristocrats and commoners to sit in a single legislative body. It is no exaggeration to say that his whole account was overdetermined by his fear of revolution in France. Whenever one speaks about the distribution of wealth, politics is never very far behind, and it is difficult for anyone to escape contemporary class prejudices and interests.

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When Reverend Malthus published his famous *Essay* in 1798, he reached conclusions even more radical than Young's. Like his compatriot, he was very afraid of the new political ideas emanating from France, and to reassure himself that there would be no comparable upheaval in Great Britain he argued that all welfare assistance to the poor must be halted at once and that reproduction by the poor should be severely scrutinized lest the world succumb to overpopulation leading to chaos and misery. It is impossible to understand Malthus's exaggeratedly somber predictions without recognizing the way fear gripped much of the European elite in the 1790s.

Ricardo: The Principle of Scarcity

In retrospect, it is obviously easy to make fun of these prophecies of doom. It is important to realize, however, that the economic and social transformations of the late eighteenth and early nineteenth centuries were objectively quite impressive, not to say traumatic, for those who witnessed them. Indeed, most contemporary observers—and not only Malthus and Young—shared relatively dark or even apocalyptic views of the long-run evolution of the distribution of wealth and class structure of society. This was true in particular of David Ricardo and Karl Marx, who were surely the two most influential economists of the nineteenth century and who both believed that a small social group—landowners for Ricardo, industrial capitalists for Marx—would inevitably claim a steadily increasing share of output and income.²

For Ricardo, who published his *Principles of Political Economy and Taxation* in 1817, the chief concern was the long-term evolution of land prices and land rents. Like Malthus, he had virtually no genuine statistics at his disposal. He nevertheless had intimate knowledge of the capitalism of his time. Born into a family of Jewish financiers with Portuguese roots, he also seems to have had fewer political prejudices than Malthus, Young, or Smith. He was influenced by the Malthusian model but pushed the argument farther. He was above all interested in the following logical paradox. Once both population and output begin to grow steadily, land tends to become increasingly scarce relative to other goods. The law of supply and demand then implies that the price of land will rise continuously, as will the rents paid to landlords. The landlords will therefore claim a growing share of national income, as the share available to the rest of the population decreases, thus upsetting the social

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equilibrium. For Ricardo, the only logically and politically acceptable answer was to impose a steadily increasing tax on land rents.

This somber prediction proved wrong: land rents did remain high for an extended period, but in the end the value of farm land inexorably declined relative to other forms of wealth as the share of agriculture in national income decreased. Writing in the 1810s, Ricardo had no way of anticipating the importance of technological progress or industrial growth in the years ahead. Like Malthus and Young, he could not imagine that humankind would ever be totally freed from the alimentary imperative.

His insight into the price of land is nevertheless interesting: the “scarcity principle” on which he relied meant that certain prices might rise to very high levels over many decades. This could well be enough to destabilize entire societies. The price system plays a key role in coordinating the activities of millions of individuals—indeed, today, billions of individuals in the new global economy. The problem is that the price system knows neither limits nor morality.

It would be a serious mistake to neglect the importance of the scarcity principle for understanding the global distribution of wealth in the twenty-first century. To convince oneself of this, it is enough to replace the price of farmland in Ricardo’s model by the price of urban real estate in major world capitals, or, alternatively, by the price of oil. In both cases, if the trend over the period 1970–2010 is extrapolated to the period 2010–2050 or 2010–2100, the result is economic, social, and political disequilibria of considerable magnitude, not only between but within countries—disequilibria that inevitably call to mind the Ricardian apocalypse.

To be sure, there exists in principle a quite simple economic mechanism that should restore equilibrium to the process: the mechanism of supply and demand. If the supply of any good is insufficient, and its price is too high, then demand for that good should decrease, which should lead to a decline in its price. In other words, if real estate and oil prices rise, then people should move to the country or take to traveling about by bicycle (or both). Never mind that such adjustments might be unpleasant or complicated; they might also take decades, during which landlords and oil well owners might well accumulate claims on the rest of the population so extensive that they could easily come to own everything that can be owned, including rural real estate and bicycles, once and for all.³ As always, the worst is never certain to arrive.

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It is much too soon to warn readers that by 2050 they may be paying rent to the emir of Qatar. I will consider the matter in due course, and my answer will be more nuanced, albeit only moderately reassuring. But it is important for now to understand that the interplay of supply and demand in no way rules out the possibility of a large and lasting divergence in the distribution of wealth linked to extreme changes in certain relative prices. This is the principal implication of Ricardo's scarcity principle. But nothing obliges us to roll the dice.

Marx: The Principle of Infinite Accumulation

By the time Marx published the first volume of *Capital* in 1867, exactly one-half century after the publication of Ricardo's *Principles*, economic and social realities had changed profoundly: the question was no longer whether farmers could feed a growing population or land prices would rise sky high but rather how to understand the dynamics of industrial capitalism, now in full blossom.

The most striking fact of the day was the misery of the industrial proletariat. Despite the growth of the economy, or perhaps in part because of it, and because, as well, of the vast rural exodus owing to both population growth and increasing agricultural productivity, workers crowded into urban slums. The working day was long, and wages were very low. A new urban misery emerged, more visible, more shocking, and in some respects even more extreme than the rural misery of the Old Regime. *Germinal*, *Oliver Twist*, and *Les Misérables* did not spring from the imaginations of their authors, any more than did laws limiting child labor in factories to children older than eight (in France in 1841) or ten in the mines (in Britain in 1842). Dr. Villermé's *Tableau de l'état physique et moral des ouvriers employés dans les manufactures*, published in France in 1840 (leading to the passage of a timid new child labor law in 1841), described the same sordid reality as *The Condition of the Working Class in England*, which Friedrich Engels published in 1845.⁴

In fact, all the historical data at our disposal today indicate that it was not until the second half—or even the final third—of the nineteenth century that a significant rise in the purchasing power of wages occurred. From the first to the sixth decade of the nineteenth century, workers' wages stagnated at very low levels—close or even inferior to the levels of the eighteenth and

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previous centuries. This long phase of wage stagnation, which we observe in Britain as well as France, stands out all the more because economic growth was accelerating in this period. The capital share of national income—industrial profits, land rents, and building rents—insofar as can be estimated with the imperfect sources available today, increased considerably in both countries in the first half of the nineteenth century.⁵ It would decrease slightly in the final decades of the nineteenth century, as wages partly caught up with growth. The data we have assembled nevertheless reveal no structural decrease in inequality prior to World War I. What we see in the period 1870–1914 is at best a stabilization of inequality at an extremely high level, and in certain respects an endless inegalitarian spiral, marked in particular by increasing concentration of wealth. It is quite difficult to say where this trajectory would have led without the major economic and political shocks initiated by the war. With the aid of historical analysis and a little perspective, we can now see those shocks as the only forces since the Industrial Revolution powerful enough to reduce inequality.

In any case, capital prospered in the 1840s and industrial profits grew, while labor incomes stagnated. This was obvious to everyone, even though in those days aggregate national statistics did not yet exist. It was in this context that the first communist and socialist movements developed. The central argument was simple: What was the good of industrial development, what was the good of all the technological innovations, toil, and population movements if, after half a century of industrial growth, the condition of the masses was still just as miserable as before, and all lawmakers could do was prohibit factory labor by children under the age of eight? The bankruptcy of the existing economic and political system seemed obvious. People therefore wondered about its long-term evolution: what could one say about it?

This was the task Marx set himself. In 1848, on the eve of the “spring of nations” (that is, the revolutions that broke out across Europe that spring), he published *The Communist Manifesto*, a short, hard-hitting text whose first chapter began with the famous words “A specter is haunting Europe—the specter of communism.”⁶ The text ended with the equally famous prediction of revolution: “The development of Modern Industry, therefore, cuts from under its feet the very foundation on which the bourgeoisie produces and appropriates products. What the bourgeoisie therefore produces, above all, are

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its own gravediggers. Its fall and the victory of the proletariat are equally inevitable.”

Over the next two decades, Marx labored over the voluminous treatise that would justify this conclusion and propose the first scientific analysis of capitalism and its collapse. This work would remain unfinished: the first volume of *Capital* was published in 1867, but Marx died in 1883 without having completed the two subsequent volumes. His friend Engels published them posthumously after piecing together a text from the sometimes obscure fragments of manuscript Marx had left behind.

Like Ricardo, Marx based his work on an analysis of the internal logical contradictions of the capitalist system. He therefore sought to distinguish himself from both bourgeois economists (who saw the market as a self-regulated system, that is, a system capable of achieving equilibrium on its own without major deviations, in accordance with Adam Smith’s image of “the invisible hand” and Jean-Baptiste Say’s “law” that production creates its own demand), and utopian socialists and Proudhonians, who in Marx’s view were content to denounce the misery of the working class without proposing a truly scientific analysis of the economic processes responsible for it.⁷ In short, Marx took the Ricardian model of the price of capital and the principle of scarcity as the basis of a more thorough analysis of the dynamics of capitalism in a world where capital was primarily industrial (machinery, plants, etc.) rather than landed property, so that in principle there was no limit to the amount of capital that could be accumulated. In fact, his principal conclusion was what one might call the “principle of infinite accumulation,” that is, the inexorable tendency for capital to accumulate and become concentrated in ever fewer hands, with no natural limit to the process. This is the basis of Marx’s prediction of an apocalyptic end to capitalism: either the rate of return on capital would steadily diminish (thereby killing the engine of accumulation and leading to violent conflict among capitalists), or capital’s share of national income would increase indefinitely (which sooner or later would unite the workers in revolt). In either case, no stable socioeconomic or political equilibrium was possible.

Marx’s dark prophecy came no closer to being realized than Ricardo’s. In the last third of the nineteenth century, wages finally began to increase: the improvement in the purchasing power of workers spread everywhere, and this changed the situation radically, even if extreme inequalities persisted and in

some respects continued to increase until World War I. The communist revolution did indeed take place, but in the most backward country in Europe, Russia, where the Industrial Revolution had scarcely begun, whereas the most advanced European countries explored other, social democratic avenues—fortunately for their citizens. Like his predecessors, Marx totally neglected the possibility of durable technological progress and steadily increasing productivity, which is a force that can to some extent serve as a counterweight to the process of accumulation and concentration of private capital. He no doubt lacked the statistical data needed to refine his predictions. He probably suffered as well from having decided on his conclusions in 1848, before embarking on the research needed to justify them. Marx evidently wrote in great political fervor, which at times led him to issue hasty pronouncements from which it was difficult to escape. That is why economic theory needs to be rooted in historical sources that are as complete as possible, and in this respect Marx did not exploit all the possibilities available to him.⁸ What is more, he devoted little thought to the question of how a society in which private capital had been totally abolished would be organized politically and economically—a complex issue if ever there was one, as shown by the tragic totalitarian experiments undertaken in states where private capital was abolished.

Despite these limitations, Marx's analysis remains relevant in several respects. First, he began with an important question (concerning the unprecedented concentration of wealth during the Industrial Revolution) and tried to answer it with the means at his disposal: economists today would do well to take inspiration from his example. Even more important, the principle of infinite accumulation that Marx proposed contains a key insight, as valid for the study of the twenty-first century as it was for the nineteenth and in some respects more worrisome than Ricardo's principle of scarcity. If the rates of population and productivity growth are relatively low, then accumulated wealth naturally takes on considerable importance, especially if it grows to extreme proportions and becomes socially destabilizing. In other words, low growth cannot adequately counterbalance the Marxist principle of infinite accumulation: the resulting equilibrium is not as apocalyptic as the one predicted by Marx but is nevertheless quite disturbing. Accumulation ends at a finite level, but that level may be high enough to be destabilizing. In particular, the very high level of private wealth that has been attained since the 1980s

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and 1990s in the wealthy countries of Europe and in Japan, measured in years of national income, directly reflects the Marxian logic.

From Marx to Kuznets, or Apocalypse to Fairy Tale

Turning from the nineteenth-century analyses of Ricardo and Marx to the twentieth-century analyses of Simon Kuznets, we might say that economists' no doubt overly developed taste for apocalyptic predictions gave way to a similarly excessive fondness for fairy tales, or at any rate happy endings. According to Kuznets's theory, income inequality would automatically decrease in advanced phases of capitalist development, regardless of economic policy choices or other differences between countries, until eventually it stabilized at an acceptable level. Proposed in 1955, this was really a theory of the magical postwar years referred to in France as the "Trente Glorieuses," the thirty glorious years from 1945 to 1975.⁹ For Kuznets, it was enough to be patient, and before long growth would benefit everyone. The philosophy of the moment was summed up in a single sentence: "Growth is a rising tide that lifts all boats." A similar optimism can also be seen in Robert Solow's 1956 analysis of the conditions necessary for an economy to achieve a "balanced growth path," that is, a growth trajectory along which all variables—output, incomes, profits, wages, capital, asset prices, and so on—would progress at the same pace, so that every social group would benefit from growth to the same degree, with no major deviations from the norm.¹⁰ Kuznets's position was thus diametrically opposed to the Ricardian and Marxist idea of an inegalitarian spiral and antithetical to the apocalyptic predictions of the nineteenth century.

In order to properly convey the considerable influence that Kuznets's theory enjoyed in the 1980s and 1990s and to a certain extent still enjoys today, it is important to emphasize that it was the first theory of this sort to rely on a formidable statistical apparatus. It was not until the middle of the twentieth century, in fact, that the first historical series of income distribution statistics became available with the publication in 1953 of Kuznets's monumental *Shares of Upper Income Groups in Income and Savings*. Kuznets's series dealt with only one country (the United States) over a period of thirty-five years (1913–48). It was nevertheless a major contribution, which drew on two sources of data totally unavailable to nineteenth-century authors: US federal income tax returns (which did not exist before the creation of the income tax

in 1913) and Kuznets's own estimates of US national income from a few years earlier. This was the very first attempt to measure social inequality on such an ambitious scale.¹¹

It is important to realize that without these two complementary and indispensable datasets, it is simply impossible to measure inequality in the income distribution or to gauge its evolution over time. To be sure, the first attempts to estimate national income in Britain and France date back to the late seventeenth and early eighteenth century, and there would be many more such attempts over the course of the nineteenth century. But these were isolated estimates. It was not until the twentieth century, in the years between the two world wars, that the first yearly series of national income data were developed by economists such as Kuznets and John W. Kendrick in the United States, Arthur Bowley and Colin Clark in Britain, and L. Dugé de Bernonville in France. This type of data allows us to measure a country's total income. In order to gauge the share of high incomes in national income, we also need statements of income. Such information became available when many countries adopted a progressive income tax around the time of World War I (1913 in the United States, 1914 in France, 1909 in Britain, 1922 in India, 1932 in Argentina).¹²

It is crucial to recognize that even where there is no income tax, there are still all sorts of statistics concerning whatever tax basis exists at a given point in time (for example, the distribution of the number of doors and windows by *département* in nineteenth-century France, which is not without interest), but these data tell us nothing about incomes. What is more, before the requirement to declare one's income to the tax authorities was enacted in law, people were often unaware of the amount of their own income. The same is true of the corporate tax and wealth tax. Taxation is not only a way of requiring all citizens to contribute to the financing of public expenditures and projects and to distribute the tax burden as fairly as possible; it is also useful for establishing classifications and promoting knowledge as well as democratic transparency.

In any event, the data that Kuznets collected allowed him to calculate the evolution of the share of each decile, as well as of the upper centiles, of the income hierarchy in total US national income. What did he find? He noted a sharp reduction in income inequality in the United States between 1913 and 1948. More specifically, at the beginning of this period, the upper decile of the

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income distribution (that is, the top 10 percent of US earners) claimed 45–50 percent of annual national income. By the late 1940s, the share of the top decile had decreased to roughly 30–35 percent of national income. This decrease of nearly 10 percentage points was considerable: for example, it was equal to half the income of the poorest 50 percent of Americans.¹³ The reduction of inequality was clear and incontrovertible. This was news of considerable importance, and it had an enormous impact on economic debate in the postwar era in both universities and international organizations.

Malthus, Ricardo, Marx, and many others had been talking about inequalities for decades without citing any sources whatsoever or any methods for comparing one era with another or deciding between competing hypotheses. Now, for the first time, objective data were available. Although the information was not perfect, it had the merit of existing. What is more, the work of compilation was extremely well documented: the weighty volume that Kuznets published in 1953 revealed his sources and methods in the most minute detail, so that every calculation could be reproduced. And besides that, Kuznets was the bearer of good news: inequality was shrinking.

The Kuznets Curve: Good News in the Midst of the Cold War

In fact, Kuznets himself was well aware that the compression of high US incomes between 1913 and 1948 was largely accidental. It stemmed in large part from multiple shocks triggered by the Great Depression and World War II and had little to do with any natural or automatic process. In his 1953 work, he analyzed his series in detail and warned readers not to make hasty generalizations. But in December 1954, at the Detroit meeting of the American Economic Association, of which he was president, he offered a far more optimistic interpretation of his results than he had given in 1953. It was this lecture, published in 1955 under the title “Economic Growth and Income Inequality,” that gave rise to the theory of the “Kuznets curve.”

According to this theory, inequality everywhere can be expected to follow a “bell curve.” In other words, it should first increase and then decrease over the course of industrialization and economic development. According to Kuznets, a first phase of naturally increasing inequality associated with the early stages of industrialization, which in the United States meant, broadly speaking, the nineteenth century, would be followed by a phase of sharply

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decreasing inequality, which in the United States allegedly began in the first half of the twentieth century.

Kuznets's 1955 paper is enlightening. After reminding readers of all the reasons for interpreting the data cautiously and noting the obvious importance of exogenous shocks in the recent reduction of inequality in the United States, Kuznets suggests, almost innocently in passing, that the internal logic of economic development might also yield the same result, quite apart from any policy intervention or external shock. The idea was that inequalities increase in the early phases of industrialization, because only a minority is prepared to benefit from the new wealth that industrialization brings. Later, in more advanced phases of development, inequality automatically decreases as a larger and larger fraction of the population partakes of the fruits of economic growth.¹⁴

The "advanced phase" of industrial development is supposed to have begun toward the end of the nineteenth or the beginning of the twentieth century in the industrialized countries, and the reduction of inequality observed in the United States between 1913 and 1948 could therefore be portrayed as one instance of a more general phenomenon, which should theoretically reproduce itself everywhere, including underdeveloped countries then mired in postcolonial poverty. The data Kuznets had presented in his 1953 book suddenly became a powerful political weapon.¹⁵ He was well aware of the highly speculative nature of his theorizing.¹⁶ Nevertheless, by presenting such an optimistic theory in the context of a "presidential address" to the main professional association of US economists, an audience that was inclined to believe and disseminate the good news delivered by their prestigious leader, he knew that he would wield considerable influence: thus the "Kuznets curve" was born. In order to make sure that everyone understood what was at stake, he took care to remind his listeners that the intent of his optimistic predictions was quite simply to maintain the underdeveloped countries "within the orbit of the free world."¹⁷ In large part, then, the theory of the Kuznets curve was a product of the Cold War.

To avoid any misunderstanding, let me say that Kuznets's work in establishing the first US national accounts data and the first historical series of inequality measures was of the utmost importance, and it is clear from reading his books (as opposed to his papers) that he shared the true scientific ethic. In addition, the high growth rates observed in all the developed coun-

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tries in the post–World War II period were a phenomenon of great significance, as was the still more significant fact that all social groups shared in the fruits of growth. It is quite understandable that the Trente Glorieuses fostered a certain degree of optimism and that the apocalyptic predictions of the nineteenth century concerning the distribution of wealth forfeited some of their popularity.

Nevertheless, the magical Kuznets curve theory was formulated in large part for the wrong reasons, and its empirical underpinnings were extremely fragile. The sharp reduction in income inequality that we observe in almost all the rich countries between 1914 and 1945 was due above all to the world wars and the violent economic and political shocks they entailed (especially for people with large fortunes). It had little to do with the tranquil process of intersectoral mobility described by Kuznets.

Putting the Distributional Question Back at the Heart of Economic Analysis

The question is important, and not just for historical reasons. Since the 1970s, income inequality has increased significantly in the rich countries, especially the United States, where the concentration of income in the first decade of the twenty-first century regained—indeed, slightly exceeded—the level attained in the second decade of the previous century. It is therefore crucial to understand clearly why and how inequality decreased in the interim. To be sure, the very rapid growth of poor and emerging countries, especially China, may well prove to be a potent force for reducing inequalities at the global level, just as the growth of the rich countries did during the period 1945–1975. But this process has generated deep anxiety in the emerging countries and even deeper anxiety in the rich countries. Furthermore, the impressive disequilibria observed in recent decades in the financial, oil, and real estate markets have naturally aroused doubts as to the inevitability of the “balanced growth path” described by Solow and Kuznets, according to whom all key economic variables are supposed to move at the same pace. Will the world in 2050 or 2100 be owned by traders, top managers, and the superrich, or will it belong to the oil-producing countries or the Bank of China? Or perhaps it will be owned by the tax havens in which many of these actors will have sought refuge. It would be absurd not to raise the question of who will own what and

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simply to assume from the outset that growth is naturally “balanced” in the long run.

In a way, we are in the same position at the beginning of the twenty-first century as our forebears were in the early nineteenth century: we are witnessing impressive changes in economies around the world, and it is very difficult to know how extensive they will turn out to be or what the global distribution of wealth, both within and between countries, will look like several decades from now. The economists of the nineteenth century deserve immense credit for placing the distributional question at the heart of economic analysis and for seeking to study long-term trends. Their answers were not always satisfactory, but at least they were asking the right questions. There is no fundamental reason why we should believe that growth is automatically balanced. It is long since past the time when we should have put the question of inequality back at the center of economic analysis and begun asking questions first raised in the nineteenth century. For far too long, economists have neglected the distribution of wealth, partly because of Kuznets’s optimistic conclusions and partly because of the profession’s undue enthusiasm for simplistic mathematical models based on so-called representative agents.¹⁸ If the question of inequality is again to become central, we must begin by gathering as extensive as possible a set of historical data for the purpose of understanding past and present trends. For it is by patiently establishing facts and patterns and then comparing different countries that we can hope to identify the mechanisms at work and gain a clearer idea of the future.

The Sources Used in This Book

This book is based on sources of two main types, which together make it possible to study the historical dynamics of wealth distribution: sources dealing with the inequality and distribution of income, and sources dealing with the distribution of wealth and the relation of wealth to income.

To begin with income: in large part, my work has simply broadened the spatial and temporal limits of Kuznets’s innovative and pioneering work on the evolution of income inequality in the United States between 1913 and 1948. In this way I have been able to put Kuznets’s findings (which are quite accurate) into a wider perspective and thus radically challenge his optimistic view of the relation between economic development and the distribution of wealth.

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Oddly, no one has ever systematically pursued Kuznets's work, no doubt in part because the historical and statistical study of tax records falls into a sort of academic no-man's-land, too historical for economists and too economic for historians. That is a pity, because the dynamics of income inequality can only be studied in a long-run perspective, which is possible only if one makes use of tax records.¹⁹

I began by extending Kuznets's methods to France, and I published the results of that study in a book that appeared in 2001.²⁰ I then joined forces with several colleagues—Anthony Atkinson and Emmanuel Saez foremost among them—and with their help was able to expand the coverage to a much wider range of countries. Anthony Atkinson looked at Great Britain and a number of other countries, and together we edited two volumes that appeared in 2007 and 2010, in which we reported the results for some twenty countries throughout the world.²¹ Together with Emmanuel Saez, I extended Kuznets's series for the United States by half a century.²² Saez himself looked at a number of other key countries, such as Canada and Japan. Many other investigators contributed to this joint effort: in particular, Facundo Alvaredo studied Argentina, Spain, and Portugal; Fabien Dell looked at Germany and Switzerland; and Abhijit Banerjee and I investigated the Indian case. With the help of Nancy Qian I was able to work on China. And so on.²³

In each case, we tried to use the same types of sources, the same methods, and the same concepts. Deciles and centiles of high incomes were estimated from tax data based on stated incomes (corrected in various ways to ensure temporal and geographic homogeneity of data and concepts). National income and average income were derived from national accounts, which in some cases had to be fleshed out or extended. Broadly speaking, our data series begin in each country when an income tax was established (generally between 1910 and 1920 but in some countries, such as Japan and Germany, as early as the 1880s and in other countries somewhat later). These series are regularly updated and at this writing extend to the early 2010s.

Ultimately, the World Top Incomes Database (WTID), which is based on the joint work of some thirty researchers around the world, is the largest historical database available concerning the evolution of income inequality; it is the primary source of data for this book.²⁴

The book's second most important source of data, on which I will actually draw first, concerns wealth, including both the distribution of wealth and its

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relation to income. Wealth also generates income and is therefore important on the income study side of things as well. Indeed, income consists of two components: income from labor (wages, salaries, bonuses, earnings from nonwage labor, and other remuneration statutorily classified as labor related) and income from capital (rent, dividends, interest, profits, capital gains, royalties, and other income derived from the mere fact of owning capital in the form of land, real estate, financial instruments, industrial equipment, etc., again regardless of its precise legal classification). The WTID contains a great deal of information about the evolution of income from capital over the course of the twentieth century. It is nevertheless essential to complete this information by looking at sources directly concerned with wealth. Here I rely on three distinct types of historical data and methodology, each of which is complementary to the others.²⁵

In the first place, just as income tax returns allow us to study changes in income inequality, estate tax returns enable us to study changes in the inequality of wealth.²⁶ This approach was introduced by Robert Lampman in 1962 to study changes in the inequality of wealth in the United States from 1922 to 1956. Later, in 1978, Anthony Atkinson and Alan Harrison studied the British case from 1923 to 1972.²⁷ These results were recently updated and extended to other countries such as France and Sweden. Unfortunately, data are available for fewer countries than in the case of income inequality. In a few cases, however, estate tax data extend back much further in time, often to the beginning of the nineteenth century, because estate taxes predate income taxes. In particular, I have compiled data collected by the French government at various times and, together with Gilles Postel-Vinay and Jean-Laurent Rosenthal, have put together a huge collection of individual estate tax returns, with which it has been possible to establish homogeneous series of data on the concentration of wealth in France since the Revolution.²⁸ This will allow us to see the shocks due to World War I in a much broader context than the series dealing with income inequality (which unfortunately date back only as far as 1910 or so). The work of Jesper Roine and Daniel Waldenström on Swedish historical sources is also instructive.²⁹

The data on wealth and inheritance also enable us to study changes in the relative importance of inherited wealth and savings in the constitution of fortunes and the dynamics of wealth inequality. This work is fairly complete in the case of France, where the very rich historical sources offer a unique

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vantage point from which to observe changing inheritance patterns over the long run.³⁰ To one degree or another, my colleagues and I have extended this work to other countries, especially Great Britain, Germany, Sweden, and the United States. These materials play a crucial role in this study, because the significance of inequalities of wealth differs depending on whether those inequalities derive from inherited wealth or savings. In this book, I focus not only on the level of inequality as such but to an even greater extent on the structure of inequality, that is, on the origins of disparities in income and wealth between social groups and on the various systems of economic, social, moral, and political justification that have been invoked to defend or condemn those disparities. Inequality is not necessarily bad in itself: the key question is to decide whether it is justified, whether there are reasons for it.

Last but not least, we can also use data that allow us to measure the total stock of national wealth (including land, other real estate, and industrial and financial capital) over a very long period of time. We can measure this wealth for each country in terms of the number of years of national income required to amass it. This type of global study of the capital/income ratio has its limits. It is always preferable to analyze wealth inequality at the individual level as well, and to gauge the relative importance of inheritance and saving in capital formation. Nevertheless, the capital/income approach can give us an overview of the importance of capital to the society as a whole. Moreover, in some cases (especially Britain and France) it is possible to collect and compare estimates for different periods and thus push the analysis back to the early eighteenth century, which allows us to view the Industrial Revolution in relation to the history of capital. For this I will rely on historical data Gabriel Zucman and I recently collected.³¹ Broadly speaking, this research is merely an extension and generalization of Raymond Goldsmith's work on national balance sheets in the 1970s.³²

Compared with previous works, one reason why this book stands out is that I have made an effort to collect as complete and consistent a set of historical sources as possible in order to study the dynamics of income and wealth distribution over the long run. To that end, I had two advantages over previous authors. First, this work benefits, naturally enough, from a longer historical perspective than its predecessors had (and some long-term changes did not emerge clearly until data for the 2000s became available, largely owing to the fact that certain shocks due to the world wars persisted for a very long time). Second,

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advances in computer technology have made it much easier to collect and process large amounts of historical data.

Although I have no wish to exaggerate the role of technology in the history of ideas, the purely technical issues are worth a moment's reflection. Objectively speaking, it was far more difficult to deal with large volumes of historical data in Kuznets's time than it is today. This was true to a large extent as recently as the 1980s. In the 1970s, when Alice Hanson Jones collected US estate inventories from the colonial era and Adeline Daumard worked on French estate records from the nineteenth century,³³ they worked mainly by hand, using index cards. When we reread their remarkable work today, or look at François Siminad's work on the evolution of wages in the nineteenth century or Ernest Labrousse's work on the history of prices and incomes in the eighteenth century or Jean Bouvier and François Furet's work on the variability of profits in the nineteenth century, it is clear that these scholars had to overcome major material difficulties in order to compile and process their data.³⁴ In many cases, the technical difficulties absorbed much of their energy, taking precedence over analysis and interpretation, especially since the technical problems imposed strict limits on their ability to make international and temporal comparisons. It is much easier to study the history of the distribution of wealth today than in the past. This book is heavily indebted to recent improvements in the technology of research.³⁵

The Major Results of This Study

What are the major conclusions to which these novel historical sources have led me? The first is that one should be wary of any economic determinism in regard to inequalities of wealth and income. The history of the distribution of wealth has always been deeply political, and it cannot be reduced to purely economic mechanisms. In particular, the reduction of inequality that took place in most developed countries between 1910 and 1950 was above all a consequence of war and of policies adopted to cope with the shocks of war. Similarly, the resurgence of inequality after 1980 is due largely to the political shifts of the past several decades, especially in regard to taxation and finance. The history of inequality is shaped by the way economic, social, and political actors view what is just and what is not, as well as by the relative power of those actors and the collective choices that result. It is the joint product of all relevant actors combined.

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The second conclusion, which is the heart of the book, is that the dynamics of wealth distribution reveal powerful mechanisms pushing alternately toward convergence and divergence. Furthermore, there is no natural, spontaneous process to prevent destabilizing, inequalitarian forces from prevailing permanently.

Consider first the mechanisms pushing toward convergence, that is, toward reduction and compression of inequalities. The main forces for convergence are the diffusion of knowledge and investment in training and skills. The law of supply and demand, as well as the mobility of capital and labor, which is a variant of that law, may always tend toward convergence as well, but the influence of this economic law is less powerful than the diffusion of knowledge and skill and is frequently ambiguous or contradictory in its implications. Knowledge and skill diffusion is the key to overall productivity growth as well as the reduction of inequality both within and between countries. We see this at present in the advances made by a number of previously poor countries, led by China. These emergent economies are now in the process of catching up with the advanced ones. By adopting the modes of production of the rich countries and acquiring skills comparable to those found elsewhere, the less developed countries have leapt forward in productivity and increased their national incomes. The technological convergence process may be abetted by open borders for trade, but it is fundamentally a process of the diffusion and sharing of knowledge—the public good par excellence—rather than a market mechanism.

From a strictly theoretical standpoint, other forces pushing toward greater equality might exist. One might, for example, assume that production technologies tend over time to require greater skills on the part of workers, so that labor's share of income will rise as capital's share falls: one might call this the "rising human capital hypothesis." In other words, the progress of technological rationality is supposed to lead automatically to the triumph of human capital over financial capital and real estate, capable managers over fat cat stockholders, and skill over nepotism. Inequalities would thus become more meritocratic and less static (though not necessarily smaller): economic rationality would then in some sense automatically give rise to democratic rationality.

Another optimistic belief, which is current at the moment, is the idea that "class warfare" will automatically give way, owing to the recent increase in life

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expectancy, to “generational warfare” (which is less divisive because everyone is first young and then old). Put differently, this inescapable biological fact is supposed to imply that the accumulation and distribution of wealth no longer presage an inevitable clash between dynasties of rentiers and dynasties owning nothing but their labor power. The governing logic is rather one of saving over the life cycle: people accumulate wealth when young in order to provide for their old age. Progress in medicine together with improved living conditions has therefore, it is argued, totally transformed the very essence of capital.

Unfortunately, these two optimistic beliefs (the human capital hypothesis and the substitution of generational conflict for class warfare) are largely illusory. Transformations of this sort are both logically possible and to some extent real, but their influence is far less consequential than one might imagine. There is little evidence that labor’s share in national income has increased significantly in a very long time: “nonhuman” capital seems almost as indispensable in the twenty-first century as it was in the eighteenth or nineteenth, and there is no reason why it may not become even more so. Now as in the past, moreover, inequalities of wealth exist primarily within age cohorts, and inherited wealth comes close to being as decisive at the beginning of the twenty-first century as it was in the age of Balzac’s *Père Goriot*. Over a long period of time, the main force in favor of greater equality has been the diffusion of knowledge and skills.

Forces of Convergence, Forces of Divergence

The crucial fact is that no matter how potent a force the diffusion of knowledge and skills may be, especially in promoting convergence between countries, it can nevertheless be thwarted and overwhelmed by powerful forces pushing in the opposite direction, toward greater inequality. It is obvious that lack of adequate investment in training can exclude entire social groups from the benefits of economic growth. Growth can harm some groups while benefiting others (witness the recent displacement of workers in the more advanced economies by workers in China). In short, the principal force for convergence—the diffusion of knowledge—is only partly natural and spontaneous. It also depends in large part on educational policies, access to training and to the acquisition of appropriate skills, and associated institutions.

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I will pay particular attention in this study to certain worrisome forces of divergence—particularly worrisome in that they can exist even in a world where there is adequate investment in skills and where all the conditions of “market efficiency” (as economists understand that term) appear to be satisfied. What are these forces of divergence? First, top earners can quickly separate themselves from the rest by a wide margin (although the problem to date remains relatively localized). More important, there is a set of forces of divergence associated with the process of accumulation and concentration of wealth when growth is weak and the return on capital is high. This second process is potentially more destabilizing than the first, and it no doubt represents the principal threat to an equal distribution of wealth over the long run.

To cut straight to the heart of the matter: in Figures I.1 and I.2 I show two basic patterns that I will try to explain in what follows. Each graph represents the importance of one of these divergent processes. Both graphs depict “U-shaped curves,” that is, a period of decreasing inequality followed by one of increasing inequality. One might assume that the realities the two graphs represent are similar. In fact they are not. The phenomena underlying the various curves are quite different and involve distinct economic, social, and political processes. Furthermore, the curve in Figure I.1 represents income inequality in the United States, while the curves in Figure I.2 depict the capital/income ratio in several European countries (Japan, though not shown, is similar). It is not out of the question that the two forces of divergence will ultimately come together in the twenty-first century. This has already happened to some extent and may yet become a global phenomenon, which could lead to levels of inequality never before seen, as well as to a radically new structure of inequality. Thus far, however, these striking patterns reflect two distinct underlying phenomena.

The US curve, shown in Figure I.1, indicates the share of the upper decile of the income hierarchy in US national income from 1910 to 2010. It is nothing more than an extension of the historical series Kuznets established for the period 1913–1948. The top decile claimed as much as 45–50 percent of national income in the 1910s–1920s before dropping to 30–35 percent by the end of the 1940s. Inequality then stabilized at that level from 1950 to 1970. We subsequently see a rapid rise in inequality in the 1980s, until by 2000 we have returned to a level on the order of 45–50 percent of national income. The magnitude of the change is impressive. It is natural to ask how far such a trend might continue.

CAPITAL IN THE TWENTY-FIRST CENTURY

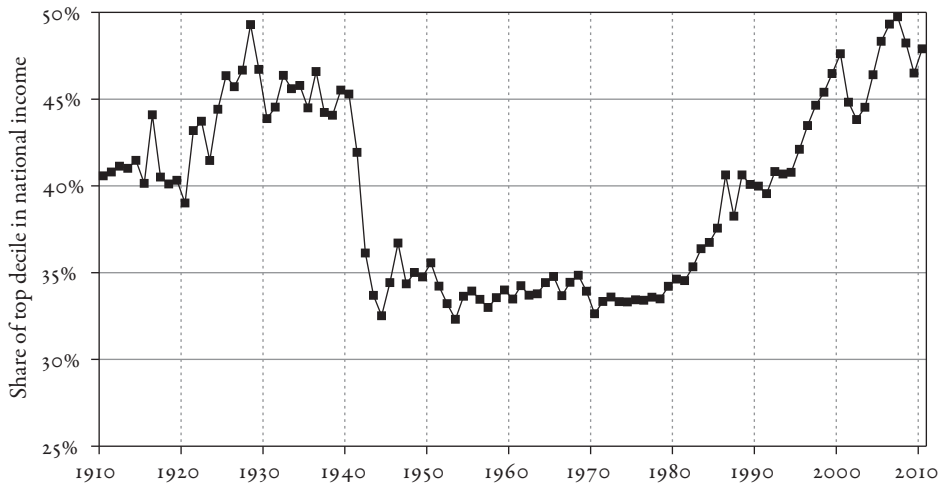


FIGURE I.1. Income inequality in the United States, 1910–2010

The top decile share in US national income dropped from 45–50 percent in the 1910s–1920s to less than 35 percent in the 1950s (this is the fall documented by Kuznets); it then rose from less than 35 percent in the 1970s to 45–50 percent in the 2000s–2010s. Sources and series: see piketty.pse.ens.fr/capital21c.

I will show that this spectacular increase in inequality largely reflects an unprecedented explosion of very elevated incomes from labor, a veritable separation of the top managers of large firms from the rest of the population. One possible explanation of this is that the skills and productivity of these top managers rose suddenly in relation to those of other workers. Another explanation, which to me seems more plausible and turns out to be much more consistent with the evidence, is that these top managers by and large have the power to set their own remuneration, in some cases without limit and in many cases without any clear relation to their individual productivity, which in any case is very difficult to estimate in a large organization. This phenomenon is seen mainly in the United States and to a lesser degree in Britain, and it may be possible to explain it in terms of the history of social and fiscal norms in those two countries over the past century. The tendency is less marked in other wealthy countries (such as Japan, Germany, France, and other continental European states), but the trend is in the same direction. To expect that the phenomenon will attain the same proportions elsewhere as it has done in the United States would be risky until we have subjected it to a

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full analysis—which unfortunately is not that simple, given the limits of the available data.

The Fundamental Force for Divergence: $r > g$

The second pattern, represented in Figure I.2, reflects a divergence mechanism that is in some ways simpler and more transparent and no doubt exerts greater influence on the long-run evolution of the wealth distribution. Figure I.2 shows the total value of private wealth (in real estate, financial assets, and professional capital, net of debt) in Britain, France and Germany, expressed in years of national income, for the period 1870–2010. Note, first of all, the very high level of private wealth in Europe in the late nineteenth century: the total amount of private wealth hovered around six or seven years of national income, which is a lot. It then fell sharply in response to the shocks of the period 1914–1945: the capital/income ratio decreased to just 2 or 3. We then observe a steady rise from 1950 on, a rise so sharp that private fortunes in the early twenty-first century seem to be on the verge of returning to five or six years of national income in both Britain and France. (Private wealth in Germany, which started at a lower level, remains lower, but the upward trend is just as clear.)

This “U-shaped curve” reflects an absolutely crucial transformation, which will figure largely in this study. In particular, I will show that the return of high capital/income ratios over the past few decades can be explained in large part by the return to a regime of relatively slow growth. In slowly growing economies, past wealth naturally takes on disproportionate importance, because it takes only a small flow of new savings to increase the stock of wealth steadily and substantially.

If, moreover, the rate of return on capital remains significantly above the growth rate for an extended period of time (which is more likely when the growth rate is low, though not automatic), then the risk of divergence in the distribution of wealth is very high.

This fundamental inequality, which I will write as $r > g$ (where r stands for the average annual rate of return on capital, including profits, dividends, interest, rents, and other income from capital, expressed as a percentage of its total value, and g stands for the rate of growth of the economy, that is, the annual increase in income or output), will play a crucial role in this book. In a sense, it sums up the overall logic of my conclusions.

CAPITAL IN THE TWENTY-FIRST CENTURY

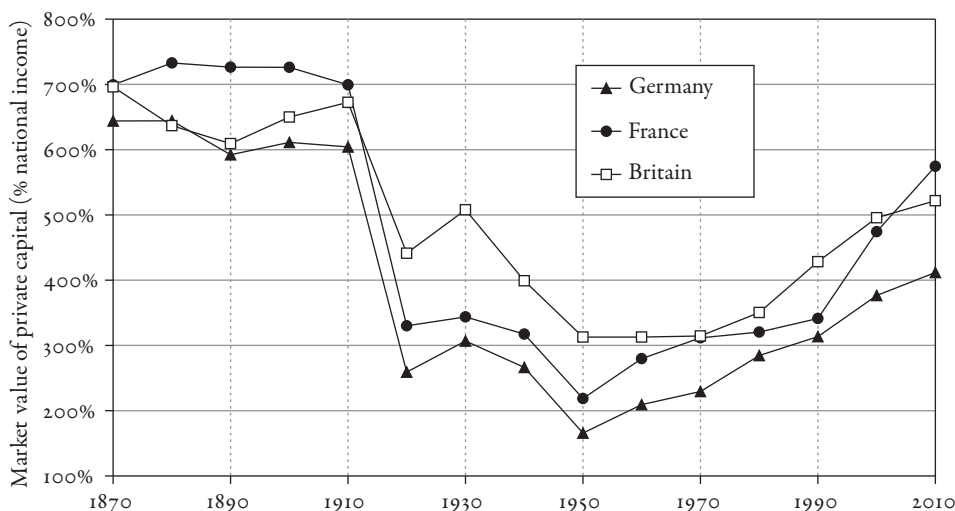


FIGURE 1.2. The capital/income ratio in Europe, 1870–2010

Aggregate private wealth was worth about six to seven years of national income in Europe in 1910, between two and three years in 1950, and between four and six years in 2010.

Sources and series: see piketty.pse.ens.fr/capital21c.

When the rate of return on capital significantly exceeds the growth rate of the economy (as it did through much of history until the nineteenth century and as is likely to be the case again in the twenty-first century), then it logically follows that inherited wealth grows faster than output and income. People with inherited wealth need save only a portion of their income from capital to see that capital grow more quickly than the economy as a whole. Under such conditions, it is almost inevitable that inherited wealth will dominate wealth amassed from a lifetime's labor by a wide margin, and the concentration of capital will attain extremely high levels—levels potentially incompatible with the meritocratic values and principles of social justice fundamental to modern democratic societies.

What is more, this basic force for divergence can be reinforced by other mechanisms. For instance, the savings rate may increase sharply with wealth.³⁶ Or, even more important, the average effective rate of return on capital may be higher when the individual's initial capital endowment is higher (as appears to be increasingly common). The fact that the return on capital is un-

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predictable and arbitrary, so that wealth can be enhanced in a variety of ways, also poses a challenge to the meritocratic model. Finally, all of these factors can be aggravated by the Ricardian scarcity principle: the high price of real estate or petroleum may contribute to structural divergence.

To sum up what has been said thus far: the process by which wealth is accumulated and distributed contains powerful forces pushing toward divergence, or at any rate toward an extremely high level of inequality. Forces of convergence also exist, and in certain countries at certain times, these may prevail, but the forces of divergence can at any point regain the upper hand, as seems to be happening now, at the beginning of the twenty-first century. The likely decrease in the rate of growth of both the population and the economy in coming decades makes this trend all the more worrisome.

My conclusions are less apocalyptic than those implied by Marx's principle of infinite accumulation and perpetual divergence (since Marx's theory implicitly relies on a strict assumption of zero productivity growth over the long run). In the model I propose, divergence is not perpetual and is only one of several possible future directions for the distribution of wealth. But the possibilities are not heartening. Specifically, it is important to note that the fundamental $r > g$ inequality, the main force of divergence in my theory, has nothing to do with any market imperfection. Quite the contrary: the more perfect the capital market (in the economist's sense), the more likely r is to be greater than g . It is possible to imagine public institutions and policies that would counter the effects of this implacable logic: for instance, a progressive global tax on capital. But establishing such institutions and policies would require a considerable degree of international coordination. It is unfortunately likely that actual responses to the problem—including various nationalist responses—will in practice be far more modest and less effective.

The Geographical and Historical Boundaries of This Study

What will the geographical and historical boundaries of this study be? To the extent possible, I will explore the dynamics of the distribution of wealth between and within countries around the world since the eighteenth century. However, the limitations of the available data will often make it necessary to narrow the scope of inquiry rather severely. In regard to the between-country

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distribution of output and income, the subject of the first part of the book, a global approach is possible from 1700 on (thanks in particular to the national accounts data compiled by Angus Maddison). When it comes to studying the capital/income ratio and capital-labor split in Part Two, the absence of adequate historical data will force me to focus primarily on the wealthy countries and proceed by extrapolation to poor and emerging countries. The examination of the evolution of inequalities of income and wealth, the subject of Part Three, will also be narrowly constrained by the limitations of the available sources. I try to include as many poor and emergent countries as possible, using data from the WTID, which aims to cover five continents as thoroughly as possible. Nevertheless, the long-term trends are far better documented in the rich countries. To put it plainly, this book relies primarily on the historical experience of the leading developed countries: the United States, Japan, Germany, France, and Great Britain.

The British and French cases turn out to be particularly significant, because the most complete long-run historical sources pertain to these two countries. We have multiple estimates of both the magnitude and structure of national wealth for Britain and France as far back as the early eighteenth century. These two countries were also the leading colonial and financial powers in the nineteenth and early twentieth centuries. It is therefore clearly important to study them if we wish to understand the dynamics of the global distribution of wealth since the Industrial Revolution. In particular, their history is indispensable for studying what has been called the “first globalization” of finance and trade (1870–1914), a period that is in many ways similar to the “second globalization,” which has been under way since the 1970s. The period of the first globalization is as fascinating as it was prodigiously inequalitarian. It saw the invention of the electric light as well as the heyday of the ocean liner (the *Titanic* sailed in 1912), the advent of film and radio, and the rise of the automobile and international investment. Note, for example, that it was not until the coming of the twenty-first century that the wealthy countries regained the same level of stock-market capitalization relative to GDP that Paris and London achieved in the early 1900s. This comparison is quite instructive for understanding today’s world.

Some readers will no doubt be surprised that I accord special importance to the study of the French case and may suspect me of nationalism. I should

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therefore justify my decision. One reason for my choice has to do with sources. The French Revolution did not create a just or ideal society, but it did make it possible to observe the structure of wealth in unprecedented detail. The system established in the 1790s for recording wealth in land, buildings, and financial assets was astonishingly modern and comprehensive for its time. The Revolution is the reason why French estate records are probably the richest in the world over the long run.

My second reason is that because France was the first country to experience the demographic transition, it is in some respects a good place to observe what awaits the rest of the planet. Although the country's population has increased over the past two centuries, the rate of increase has been relatively low. The population of the country was roughly 30 million at the time of the Revolution, and it is slightly more than 60 million today. It is the same country, with a population whose order of magnitude has not changed. By contrast, the population of the United States at the time of the Declaration of Independence was barely 3 million. By 1900 it was 100 million, and today it is above 300 million. When a country goes from a population of 3 million to a population of 300 million (to say nothing of the radical increase in territory owing to westward expansion in the nineteenth century), it is clearly no longer the same country.

The dynamics and structure of inequality look very different in a country whose population increases by a factor of 100 compared with a country whose population merely doubles. In particular, the inheritance factor is much less important in the former than in the latter. It has been the demographic growth of the New World that has ensured that inherited wealth has always played a smaller role in the United States than in Europe. This factor also explains why the structure of inequality in the United States has always been so peculiar, and the same can be said of US representations of inequality and social class. But it also suggests that the US case is in some sense not generalizable (because it is unlikely that the population of the world will increase a hundredfold over the next two centuries) and that the French case is more typical and more pertinent for understanding the future. I am convinced that detailed analysis of the French case, and more generally of the various historical trajectories observed in other developed countries in Europe, Japan, North America, and Oceania, can tell us a great deal about the future dynamics of global wealth, including such emergent economies as China, Brazil, and

India, where demographic and economic growth will undoubtedly slow in the future (as they have done already).

Finally, the French case is interesting because the French Revolution—the “bourgeois” revolution par excellence—quickly established an ideal of legal equality in relation to the market. It is interesting to look at how this ideal affected the dynamics of wealth distribution. Although the English Revolution of 1688 established modern parliamentarism, it left standing a royal dynasty, primogeniture on landed estates (ended only in the 1920s), and political privileges for the hereditary nobility (reform of the House of Lords is still under discussion, a bit late in the day). Although the American Revolution established the republican principle, it allowed slavery to continue for nearly a century and legal racial discrimination for nearly two centuries. The race question still has a disproportionate influence on the social question in the United States today. In a way, the French Revolution of 1789 was more ambitious. It abolished all legal privileges and sought to create a political and social order based entirely on equality of rights and opportunities. The Civil Code guaranteed absolute equality before the laws of property as well as freedom of contract (for men, at any rate). In the late nineteenth century, conservative French economists such as Paul Leroy-Beaulieu often used this argument to explain why republican France, a nation of “small property owners” made egalitarian by the Revolution, had no need of a progressive or confiscatory income tax or estate tax, in contrast to aristocratic and monarchical Britain. The data show, however, that the concentration of wealth was as large at that time in France as in Britain, which clearly demonstrates that equality of rights in the marketplace cannot ensure equality of rights tout court. Here again, the French experience is quite relevant to today’s world, where many commentators continue to believe, as Leroy-Beaulieu did a little more than a century ago, that ever more fully guaranteed property rights, ever freer markets, and ever “purer and more perfect” competition are enough to ensure a just, prosperous, and harmonious society. Unfortunately, the task is more complex.

The Theoretical and Conceptual Framework

Before proceeding, it may be useful to say a little more about the theoretical and conceptual framework of this research as well as the intellectual itinerary that led me to write this book.

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I belong to a generation that turned eighteen in 1989, which was not only the bicentennial of the French Revolution but also the year when the Berlin Wall fell. I belong to a generation that came of age listening to news of the collapse of the Communist dictatorships and never felt the slightest affection or nostalgia for those regimes or for the Soviet Union. I was vaccinated for life against the conventional but lazy rhetoric of anticapitalism, some of which simply ignored the historic failure of Communism and much of which turned its back on the intellectual means necessary to push beyond it. I have no interest in denouncing inequality or capitalism per se—especially since social inequalities are not in themselves a problem as long as they are justified, that is, “founded only upon common utility,” as article 1 of the 1789 Declaration of the Rights of Man and the Citizen proclaims. (Although this definition of social justice is imprecise but seductive, it is rooted in history. Let us accept it for now. I will return to this point later on.) By contrast, I am interested in contributing, however modestly, to the debate about the best way to organize society and the most appropriate institutions and policies to achieve a just social order. Furthermore, I would like to see justice achieved effectively and efficiently under the rule of law, which should apply equally to all and derive from universally understood statutes subject to democratic debate.

I should perhaps add that I experienced the American dream at the age of twenty-two, when I was hired by a university near Boston just after finishing my doctorate. This experience proved to be decisive in more ways than one. It was the first time I had set foot in the United States, and it felt good to have my work recognized so quickly. Here was a country that knew how to attract immigrants when it wanted to! Yet I also realized quite soon that I wanted to return to France and Europe, which I did when I was twenty-five. Since then, I have not left Paris, except for a few brief trips. One important reason for my choice has a direct bearing on this book: I did not find the work of US economists entirely convincing. To be sure, they were all very intelligent, and I still have many friends from that period of my life. But something strange happened: I was only too aware of the fact that I knew nothing at all about the world’s economic problems. My thesis consisted of several relatively abstract mathematical theorems. Yet the profession liked my work. I quickly realized that there had been no significant effort to collect historical data on the dynamics of inequality since Kuznets, yet the profession continued to churn out purely theoretical results without even knowing what facts needed to be

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explained. And it expected me to do the same. When I returned to France, I set out to collect the missing data.

To put it bluntly, the discipline of economics has yet to get over its childish passion for mathematics and for purely theoretical and often highly ideological speculation, at the expense of historical research and collaboration with the other social sciences. Economists are all too often preoccupied with petty mathematical problems of interest only to themselves. This obsession with mathematics is an easy way of acquiring the appearance of scientificity without having to answer the far more complex questions posed by the world we live in. There is one great advantage to being an academic economist in France: here, economists are not highly respected in the academic and intellectual world or by political and financial elites. Hence they must set aside their contempt for other disciplines and their absurd claim to greater scientific legitimacy, despite the fact that they know almost nothing about anything. This, in any case, is the charm of the discipline and of the social sciences in general: one starts from square one, so that there is some hope of making major progress. In France, I believe, economists are slightly more interested in persuading historians and sociologists, as well as people outside the academic world, that what they are doing is interesting (although they are not always successful). My dream when I was teaching in Boston was to teach at the *École des Hautes Études en Sciences Sociales*, whose faculty has included such leading lights as Lucien Febvre, Fernand Braudel, Claude Lévi-Strauss, Pierre Bourdieu, Françoise Héritier, and Maurice Godelier, to name a few. Dare I admit this, at the risk of seeming chauvinistic in my view of the social sciences? I probably admire these scholars more than Robert Solow or even Simon Kuznets, even though I regret the fact that the social sciences have largely lost interest in the distribution of wealth and questions of social class since the 1970s. Before that, statistics about income, wages, prices, and wealth played an important part in historical and sociological research. In any case, I hope that both professional social scientists and amateurs of all fields will find something of interest in this book, starting with those who claim to “know nothing about economics” but who nevertheless have very strong opinions about inequality of income and wealth, as is only natural.

The truth is that economics should never have sought to divorce itself from the other social sciences and can advance only in conjunction with them. The social sciences collectively know too little to waste time on foolish disci-

INTRODUCTION

plinary squabbles. If we are to progress in our understanding of the historical dynamics of the wealth distribution and the structure of social classes, we must obviously take a pragmatic approach and avail ourselves of the methods of historians, sociologists, and political scientists as well as economists. We must start with fundamental questions and try to answer them. Disciplinary disputes and turf wars are of little or no importance. In my mind, this book is as much a work of history as of economics.

As I explained earlier, I began this work by collecting sources and establishing historical time series pertaining to the distribution of income and wealth. As the book proceeds, I sometimes appeal to theory and to abstract models and concepts, but I try to do so sparingly, and only to the extent that theory enhances our understanding of the changes we observe. For example, income, capital, the economic growth rate, and the rate of return on capital are abstract concepts—theoretical constructs rather than mathematical certainties. Yet I will show that these concepts allow us to analyze historical reality in interesting ways, provided that we remain clear-eyed and critical about the limited precision with which we can measure these things. I will also use a few equations, such as $\alpha = r \times \beta$ (which says that the share of capital in national income is equal to the product of the return on capital and the capital/income ratio), or $\beta = s/g$ (which says that the capital/income ratio is equal in the long run to the savings rate divided by the growth rate). I ask readers not well versed in mathematics to be patient and not immediately close the book: these are elementary equations, which can be explained in a simple, intuitive way and can be understood without any specialized technical knowledge. Above all, I try to show that this minimal theoretical framework is sufficient to give a clear account of what everyone will recognize as important historical developments.

Outline of the Book

The remainder of the book consists of sixteen chapters divided into four parts. Part One, titled “Income and Capital,” contains two chapters and introduces basic ideas that are used repeatedly in the remainder of the book. Specifically, Chapter 1 presents the concepts of national income, capital, and the capital/income ratio and then describes in broad brushstrokes how the global distribution of income and output has evolved. Chapter 2 gives a more

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detailed analysis of how the growth rates of population and output have evolved since the Industrial Revolution. This first part of the book contains nothing really new, and the reader familiar with these ideas and with the history of global growth since the eighteenth century may wish to skip directly to Part Two.

The purpose of Part Two, titled “The Dynamics of the Capital/Income Ratio,” which consists of four chapters, is to examine the prospects for the long-run evolution of the capital/income ratio and the global division of national income between labor and capital in the twenty-first century. Chapter 3 looks at the metamorphoses of capital since the eighteenth century, starting with the British and French cases, about which we possess the most data over the long run. Chapter 4 introduces the German and US cases. Chapters 5 and 6 extend the geographical range of the analysis to the entire planet, insofar as the sources allow, and seek to draw the lessons from all of these historical experiences that can enable us to anticipate the possible evolution of the capital/income ratio and the relative shares of capital and labor in the decades to come.

Part Three, titled “The Structure of Inequality,” consists of six chapters. Chapter 7 familiarizes the reader with the orders of magnitude of inequality attained in practice by the distribution of income from labor on the one hand and of capital ownership and income from capital on the other. Chapter 8 then analyzes the historical dynamics of these inequalities, starting with a comparison of France and the United States. Chapters 9 and 10 extend the analysis to all the countries for which we have historical data (in the WTID), looking separately at inequalities related to labor and capital, respectively. Chapter 11 studies the changing importance of inherited wealth over the long run. Finally, Chapter 12 looks at the prospects for the global distribution of wealth over the first few decades of the twenty-first century.

The purpose of Part Four, titled “Regulating Capital in the Twenty-First Century” and consisting of four chapters, is to draw normative and policy lessons from the previous three parts, whose purpose is primarily to establish the facts and understand the reasons for the observed changes. Chapter 13 examines what a “social state” suited to present conditions might look like. Chapter 14 proposes a rethinking of the progressive income tax based on past experience and recent trends. Chapter 15 describes what a progressive tax on capital adapted to twenty-first century conditions might look like and compares this idealized tool to other types of regulation that might emerge from

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the political process, ranging from a wealth tax in Europe to capital controls in China, immigration reform in the United States, and revival of protectionism in many countries. Chapter 16 deals with the pressing question of public debt and the related issue of the optimal accumulation of public capital at a time when natural capital may be deteriorating.

One final word. It would have been quite presumptuous in 1913 to publish a book called “Capital in the Twentieth Century.” I beg the reader’s indulgence for giving the title *Capital in the Twenty-First Century* to this book, which appeared in French in 2013 and in English in 2014. I am only too well aware of my total inability to predict what form capital will take in 2063 or 2113. As I already noted, and as I will frequently show in what follows, the history of income and wealth is always deeply political, chaotic, and unpredictable. How this history plays out depends on how societies view inequalities and what kinds of policies and institutions they adopt to measure and transform them. No one can foresee how these things will change in the decades to come. The lessons of history are nevertheless useful, because they help us to see a little more clearly what kinds of choices we will face in the coming century and what sorts of dynamics will be at work. The sole purpose of the book, which logically speaking should have been entitled “Capital at the Dawn of the Twenty-First Century,” is to draw from the past a few modest keys to the future. Since history always invents its own pathways, the actual usefulness of these lessons from the past remains to be seen. I offer them to readers without presuming to know their full import.

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PART ONE

INCOME AND CAPITAL

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Income and Output

On August 16, 2012, the South African police intervened in a labor conflict between workers at the Marikana platinum mine near Johannesburg and the mine's owners: the stockholders of Lonmin, Inc., based in London. Police fired on the strikers with live ammunition. Thirty-four miners were killed.¹ As often in such strikes, the conflict primarily concerned wages: the miners had asked for a doubling of their wage from 500 to 1,000 euros a month. After the tragic loss of life, the company finally proposed a monthly raise of 75 euros.²

This episode reminds us, if we needed reminding, that the question of what share of output should go to wages and what share to profits—in other words, how should the income from production be divided between labor and capital?—has always been at the heart of distributional conflict. In traditional societies, the basis of social inequality and most common cause of rebellion was the conflict of interest between landlord and peasant, between those who owned land and those who cultivated it with their labor, those who received land rents and those who paid them. The Industrial Revolution exacerbated the conflict between capital and labor, perhaps because production became more capital intensive than in the past (making use of machinery and exploiting natural resources more than ever before) and perhaps, too, because hopes for a more equitable distribution of income and a more democratic social order were dashed. I will come back to this point.

The Marikana tragedy calls to mind earlier instances of violence. At Haymarket Square in Chicago on May 1, 1886, and then at Fourmies, in northern France, on May 1, 1891, police fired on workers striking for higher wages. Does this kind of violent clash between labor and capital belong to the past, or will it be an integral part of twenty-first-century history?

The first two parts of this book focus on the respective shares of global income going to labor and capital and on how those shares have changed since the eighteenth century. I will temporarily set aside the issue of income inequality between workers (for example, between an ordinary worker, an engineer,

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and a plant manager) and between capitalists (for example, between small, medium, and large stockholders or landlords) until Part Three. Clearly, each of these two dimensions of the distribution of wealth—the “factorial” distribution in which labor and capital are treated as “factors of production,” viewed in the abstract as homogeneous entities, and the “individual” distribution, which takes account of inequalities of income from labor and capital at the individual level—is in practice fundamentally important. It is impossible to achieve a satisfactory understanding of the distributional problem without analyzing both.³

In any case, the Marikana miners were striking not only against what they took to be Lonmin’s excessive profits but also against the apparently fabulous salary awarded to the mine’s manager and the difference between his compensation and theirs.⁴ Indeed, if capital ownership were equally distributed and each worker received an equal share of profits in addition to his or her wages, virtually no one would be interested in the division of earnings between profits and wages. If the capital-labor split gives rise to so many conflicts, it is due first and foremost to the extreme concentration of the ownership of capital. Inequality of wealth—and of the consequent income from capital—is in fact always much greater than inequality of income from labor. I will analyze this phenomenon and its causes in Part Three. For now, I will take the inequality of income from labor and capital as given and focus on the global division of national income between capital and labor.

To be clear, my purpose here is not to plead the case of workers against owners but rather to gain as clear as possible a view of reality. Symbolically, the inequality of capital and labor is an issue that arouses strong emotions. It clashes with widely held ideas of what is and is not just, and it is hardly surprising if this sometimes leads to physical violence. For those who own nothing but their labor power and who often live in humble conditions (not to say wretched conditions in the case of eighteenth-century peasants or the Marikana miners), it is difficult to accept that the owners of capital—some of whom have inherited at least part of their wealth—are able to appropriate so much of the wealth produced by their labor. Capital’s share can be quite large: often as much as one-quarter of total output and sometimes as high as one-half in capital-intensive sectors such as mining, or even more where local monopolies allow the owners of capital to demand an even larger share.

Of course, everyone can also understand that if all the company’s earnings from its output went to paying wages and nothing to profits, it would proba-

bly be difficult to attract the capital needed to finance new investments, at least as our economies are currently organized (to be sure, one can imagine other forms of organization). Furthermore, it is not necessarily just to deny any remuneration to those who choose to save more than others—assuming, of course, that differences in saving are an important reason for the inequality of wealth. Bear in mind, too, that a portion of what is called “the income of capital” may be remuneration for “entrepreneurial” labor, and this should no doubt be treated as we treat other forms of labor. This classic argument deserves closer scrutiny. Taking all these elements into account, what is the “right” split between capital and labor? Can we be sure that an economy based on the “free market” and private property always and everywhere leads to an optimal division, as if by magic? In an ideal society, how would one arrange the division between capital and labor? How should one think about the problem?

The Capital-Labor Split in the Long Run: Not So Stable

If this study is to make even modest progress on these questions and at least clarify the terms of a debate that appears to be endless, it will be useful to begin by establishing some facts as accurately and carefully as possible. What exactly do we know about the evolution of the capital-labor split since the eighteenth century? For a long time, the idea accepted by most economists and uncritically repeated in textbooks was that the relative shares of labor and capital in national income were quite stable over the long run, with the generally accepted figure being two-thirds for labor and one-third for capital.⁵ Today, with the advantage of greater historical perspective and newly available data, it is clear that the reality was quite a bit more complex.

For one thing, the capital-labor split varied widely over the course of the twentieth century. The changes observed in the nineteenth century, which I touched on in the Introduction (an increase in the capital share in the first half of the century, followed by a slight decrease and then a period of stability), seem mild by comparison. Briefly, the shocks that buffeted the economy in the period 1914–1945—World War I, the Bolshevik Revolution of 1917, the Great Depression, World War II, and the consequent advent of new regulatory and tax policies along with controls on capital—reduced capital’s share of income to historically low levels in the 1950s. Very soon, however, capital

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began to reconstitute itself. The growth of capital's share accelerated with the victories of Margaret Thatcher in England in 1979 and Ronald Reagan in the United States in 1980, marking the beginning of a conservative revolution. Then came the collapse of the Soviet bloc in 1989, followed by financial globalization and deregulation in the 1990s. All of these events marked a political turn in the opposite direction from that observed in the first half of the twentieth century. By 2010, and despite the crisis that began in 2007–2008, capital was prospering as it had not done since 1913. Not all of the consequences of capital's renewed prosperity were negative; to some extent it was a natural and desirable development. But it has changed the way we look at the capital-labor split since the beginning of the twenty-first century, as well as our view of changes likely to occur in the decades to come.

Furthermore, if we look beyond the twentieth century and adopt a very long-term view, the idea of a stable capital-labor split must somehow deal with the fact that the nature of capital itself has changed radically (from land and other real estate in the eighteenth century to industrial and financial capital in the twenty-first century). There is also the idea, widespread among economists, that modern economic growth depends largely on the rise of "human capital." At first glance, this would seem to imply that labor should claim a growing share of national income. And one does indeed find that there may be a tendency for labor's share to increase over the very long run, but the gains are relatively modest: capital's share (excluding human capital) in the early decades of the twenty-first century is only slightly smaller than it was at the beginning of the nineteenth century. The importance of capital in the wealthy countries today is primarily due to a slowing of both demographic growth and productivity growth, coupled with political regimes that objectively favor private capital.

The most fruitful way to understand these changes is to analyze the evolution of the capital/income ratio (that is, the ratio of the total stock of capital to the annual flow of income) rather than focus exclusively on the capital-labor split (that is, the share of income going to capital and labor, respectively). In the past, scholars have mainly studied the latter, largely owing to the lack of adequate data to do anything else.

Before presenting my results in detail, it is best to proceed by stages. The purpose of Part One of this book is to introduce certain basic notions. In the remainder of this chapter, I will begin by presenting the concepts of domestic product and national income, capital and labor, and the capital/income ratio.

Then I will look at how the global distribution of income has changed since the Industrial Revolution. In Chapter 2, I will analyze the general evolution of growth rates over time. This will play a central role in the subsequent analysis.

With these preliminaries out of the way, Part Two takes up the dynamics of the capital/income ratio and the capital-labor split, once again proceeding by stages. Chapter 3 will look at changes in the composition of capital and the capital/income ratio since the eighteenth century, beginning with Britain and France, about which we have the best long-run data. Chapter 4 introduces the German case and above all looks at the United States, which serves as a useful complement to the European prism. Finally, Chapters 5 and 6 attempt to extend the analysis to all the rich countries of the world and, insofar as possible, to the entire planet. I also attempt to draw conclusions relevant to the global dynamics of the capital/income ratio and capital-labor split in the twenty-first century.

The Idea of National Income

It will be useful to begin with the concept of “national income,” to which I will frequently refer in what follows. National income is defined as the sum of all income available to the residents of a given country in a given year, regardless of the legal classification of that income.

National income is closely related to the idea of GDP, which comes up often in public debate. There are, however, two important differences between GDP and national income. GDP measures the total of goods and services produced in a given year within the borders of a given country. In order to calculate national income, one must first subtract from GDP the depreciation of the capital that made this production possible: in other words, one must deduct wear and tear on buildings, infrastructure, machinery, vehicles, computers, and other items during the year in question. This depreciation is substantial, today on the order of 10 percent of GDP in most countries, and it does not correspond to anyone’s income: before wages are distributed to workers or dividends to stockholders, and before genuinely new investments are made, worn-out capital must be replaced or repaired. If this is not done, wealth is lost, resulting in negative income for the owners. When depreciation is subtracted from GDP, one obtains the “net domestic product,” which I will refer

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to more simply as “domestic output” or “domestic production,” which is typically 90 percent of GDP.

Then one must add net income received from abroad (or subtract net income paid to foreigners, depending on each country’s situation). For example, a country whose firms and other capital assets are owned by foreigners may well have a high domestic product but a much lower national income, once profits and rents flowing abroad are deducted from the total. Conversely, a country that owns a large portion of the capital of other countries may enjoy a national income much higher than its domestic product.

Later I will give examples of both of these situations, drawn from the history of capitalism as well as from today’s world. I should say at once that this type of international inequality can give rise to great political tension. It is not an insignificant thing when one country works for another and pays out a substantial share of its output as dividends and rent to foreigners over a long period of time. In many cases, such a system can survive (to a point) only if sustained by relations of political domination, as was the case in the colonial era, when Europe effectively owned much of the rest of the world. A key question of this research is the following: Under what conditions is this type of situation likely to recur in the twenty-first century, possibly in some novel geographic configuration? For example, Europe, rather than being the owner, may find itself owned. Such fears are currently widespread in the Old World—perhaps too widespread. We shall see.

At this stage, suffice it to say that most countries, whether wealthy or emergent, are currently in much more balanced situations than one sometimes imagines. In France as in the United States, Germany as well as Great Britain, China as well as Brazil, and Japan as well as Italy, national income is within 1 or 2 percent of domestic product. In all these countries, in other words, the inflow of profits, interest, dividends, rent, and so on is more or less balanced by a comparable outflow. In wealthy countries, net income from abroad is generally slightly positive. To a first approximation, the residents of these countries own as much in foreign real estate and financial instruments as foreigners own of theirs. Contrary to a tenacious myth, France is not owned by California pension funds or the Bank of China, any more than the United States belongs to Japanese and German investors. The fear of getting into such a predicament is so strong today that fantasy often outstrips reality. The reality is that inequality with respect to capital is a far greater domestic issue than it is an international one. Inequality in the ownership of capital brings the rich and poor within each country into

INCOME AND OUTPUT

conflict with one another far more than it pits one country against another. This has not always been the case, however, and it is perfectly legitimate to ask whether our future may not look more like our past, particularly since certain countries—Japan, Germany, the oil-exporting countries, and to a lesser degree China—have in recent years accumulated substantial claims on the rest of the world (though by no means as large as the record claims of the colonial era). Furthermore, the very substantial increase in cross-ownership, in which various countries own substantial shares of one another, can give rise to a legitimate sense of dispossession, even when net asset positions are close to zero.

To sum up, a country's national income may be greater or smaller than its domestic product, depending on whether net income from abroad is positive or negative.

National income = domestic output + net income from abroad⁶

At the global level, income received from abroad and paid abroad must balance, so that income is by definition equal to output:

Global income = global output⁷

This equality between two annual flows, income and output, is an accounting identity, yet it reflects an important reality. In any given year, it is impossible for total income to exceed the amount of new wealth that is produced (globally speaking; a single country may of course borrow from abroad). Conversely, all production must be distributed as income in one form or another, to either labor or capital: whether as wages, salaries, honoraria, bonuses, and so on (that is, as payments to workers and others who contributed labor to the process of production) or else as profits, dividends, interest, rents, royalties, and so on (that is, as payments to the owners of capital used in the process of production).

What Is Capital?

To recapitulate: regardless of whether we are looking at the accounts of a company, a nation, or the global economy, the associated output and income can be decomposed as the sum of income to capital and income to labor:

National income = capital income + labor income

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But what is capital? What are its limits? What forms does it take? How has its composition changed over time? This question, central to this investigation, will be examined in greater detail in subsequent chapters. For now it will suffice to make the following points:

First, throughout this book, when I speak of “capital” without further qualification, I always exclude what economists often call (unfortunately, to my mind) “human capital,” which consists of an individual’s labor power, skills, training, and abilities. In this book, capital is defined as the sum total of nonhuman assets that can be owned and exchanged on some market. Capital includes all forms of real property (including residential real estate) as well as financial and professional capital (plants, infrastructure, machinery, patents, and so on) used by firms and government agencies.

There are many reasons for excluding human capital from our definition of capital. The most obvious is that human capital cannot be owned by another person or traded on a market (not permanently, at any rate). This is a key difference from other forms of capital. One can of course put one’s labor services up for hire under a labor contract of some sort. In all modern legal systems, however, such an arrangement has to be limited in both time and scope. In slave societies, of course, this is obviously not true: there, a slaveholder can fully and completely own the human capital of another person and even of that person’s offspring. In such societies, slaves can be bought and sold on the market and conveyed by inheritance, and it is common to include slaves in calculating a slaveholder’s wealth. I will show how this worked when I examine the composition of private capital in the southern United States before 1865. Leaving such special (and for now historical) cases aside, it makes little sense to attempt to add human and nonhuman capital. Throughout history, both forms of wealth have played fundamental and complementary roles in economic growth and development and will continue to do so in the twenty-first century. But in order to understand the growth process and the inequalities it engenders, we must distinguish carefully between human and nonhuman capital and treat each one separately.

Nonhuman capital, which in this book I will call simply “capital,” includes all forms of wealth that individuals (or groups of individuals) can own and that can be transferred or traded through the market on a permanent basis. In practice, capital can be owned by private individuals (in which case we speak of “private capital”) or by the government or government agencies

(in which case we speak of “public capital”). There are also intermediate forms of collective property owned by “moral persons” (that is, entities such as foundations and churches) pursuing specific aims. I will come back to this. The boundary between what private individuals can and cannot own has evolved considerably over time and around the world, as the extreme case of slavery indicates. The same is true of property in the atmosphere, the sea, mountains, historical monuments, and knowledge. Certain private interests would like to own these things, and sometimes they justify this desire on grounds of efficiency rather than mere self-interest. But there is no guarantee that this desire coincides with the general interest. Capital is not an immutable concept: it reflects the state of development and prevailing social relations of each society.

Capital and Wealth

To simplify the text, I use the words “capital” and “wealth” interchangeably, as if they were perfectly synonymous. By some definitions, it would be better to reserve the word “capital” to describe forms of wealth accumulated by human beings (buildings, machinery, infrastructure, etc.) and therefore to exclude land and natural resources, with which humans have been endowed without having to accumulate them. Land would then be a component of wealth but not of capital. The problem is that it is not always easy to distinguish the value of buildings from the value of the land on which they are built. An even greater difficulty is that it is very hard to gauge the value of “virgin” land (as humans found it centuries or millennia ago) apart from improvements due to human intervention, such as drainage, irrigation, fertilization, and so on. The same problem arises in connection with natural resources such as petroleum, gas, rare earth elements, and the like, whose pure value is hard to distinguish from the value added by the investments needed to discover new deposits and prepare them for exploitation. I therefore include all these forms of wealth in capital. Of course, this choice does not eliminate the need to look closely at the origins of wealth, especially the boundary line between accumulation and appropriation.

Some definitions of “capital” hold that the term should apply only to those components of wealth directly employed in the production process. For instance, gold might be counted as part of wealth but not of capital, because

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gold is said to be useful only as a store of value. Once again, this limitation strikes me as neither desirable nor practical (because gold can be a factor of production, not only in the manufacture of jewelry but also in electronics and nanotechnology). Capital in all its forms has always played a dual role, as both a store of value and a factor of production. I therefore decided that it was simpler not to impose a rigid distinction between wealth and capital.

Similarly, I ruled out the idea of excluding residential real estate from capital on the grounds that it is “unproductive,” unlike the “productive capital” used by firms and government: industrial plants, office buildings, machinery, infrastructure, and so on. The truth is that all these forms of wealth are useful and productive and reflect capital’s two major economic functions. Residential real estate can be seen as a capital asset that yields “housing services,” whose value is measured by their rental equivalent. Other capital assets can serve as factors of production for firms and government agencies that produce goods and services (and need plants, offices, machinery, infrastructure, etc. to do so). Each of these two types of capital currently accounts for roughly half the capital stock in the developed countries.

To summarize, I define “national wealth” or “national capital” as the total market value of everything owned by the residents and government of a given country at a given point in time, provided that it can be traded on some market.⁸ It consists of the sum total of nonfinancial assets (land, dwellings, commercial inventory, other buildings, machinery, infrastructure, patents, and other directly owned professional assets) and financial assets (bank accounts, mutual funds, bonds, stocks, financial investments of all kinds, insurance policies, pension funds, etc.), less the total amount of financial liabilities (debt).⁹ If we look only at the assets and liabilities of private individuals, the result is private wealth or private capital. If we consider assets and liabilities held by the government and other governmental entities (such as towns, social insurance agencies, etc.), the result is public wealth or public capital. By definition, national wealth is the sum of these two terms:

National wealth = private wealth + public wealth

Public wealth in most developed countries is currently insignificant (or even negative, where the public debt exceeds public assets). As I will show, private wealth accounts for nearly all of national wealth almost everywhere.

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This has not always been the case, however, so it is important to distinguish clearly between the two notions.

To be clear, although my concept of capital excludes human capital (which cannot be exchanged on any market in nonslave societies), it is not limited to “physical” capital (land, buildings, infrastructure, and other material goods). I include “immaterial” capital such as patents and other intellectual property, which are counted either as nonfinancial assets (if individuals hold patents directly) or as financial assets (when an individual owns shares of a corporation that holds patents, as is more commonly the case). More broadly, many forms of immaterial capital are taken into account by way of the stock market capitalization of corporations. For instance, the stock market value of a company often depends on its reputation and trademarks, its information systems and modes of organization, its investments, whether material or immaterial, for the purpose of making its products and services more visible and attractive, and so on. All of this is reflected in the price of common stock and other corporate financial assets and therefore in national wealth.

To be sure, the price that the financial markets sets on a company’s or even a sector’s immaterial capital at any given moment is largely arbitrary and uncertain. We see this in the collapse of the Internet bubble in 2000, in the financial crisis that began in 2007–2008, and more generally in the enormous volatility of the stock market. The important fact to note for now is that this is a characteristic of all forms of capital, not just immaterial capital. Whether we are speaking of a building or a company, a manufacturing firm or a service firm, it is always very difficult to set a price on capital. Yet as I will show, total national wealth, that is, the wealth of a country as a whole and not of any particular type of asset, obeys certain laws and conforms to certain regular patterns.

One further point: total national wealth can always be broken down into domestic capital and foreign capital:

National wealth = national capital = domestic capital + net foreign capital

Domestic capital is the value of the capital stock (buildings, firms, etc.) located within the borders of the country in question. Net foreign capital—or net foreign assets—measures the country’s position vis-à-vis the rest of the world: more specifically, it is the difference between assets owned by the

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country's citizens in the rest of the world and assets of the country owned by citizens of other countries. On the eve of World War I, Britain and France both enjoyed significant net positive asset positions vis-à-vis the rest of the world. One characteristic of the financial globalization that has taken place since the 1980s is that many countries have more or less balanced net asset positions, but those positions are quite large in absolute terms. In other words, many countries have large capital stakes in other countries, but those other countries also have stakes in the country in question, and the two positions are more or less equal, so that net foreign capital is close to zero. Globally, of course, all the net positions must add up to zero, so that total global wealth equals the "domestic" capital of the planet as a whole.

The Capital/Income Ratio

Now that income and capital have been defined, I can move on to the first basic law tying these two ideas together. I begin by defining the capital/income ratio.

Income is a flow. It corresponds to the quantity of goods produced and distributed in a given period (which we generally take to be a year).

Capital is a stock. It corresponds to the total wealth owned at a given point in time. This stock comes from the wealth appropriated or accumulated in all prior years combined.

The most natural and useful way to measure the capital stock in a particular country is to divide that stock by the annual flow of income. This gives us the capital/income ratio, which I denote by the Greek letter β .

For example, if a country's total capital stock is the equivalent of six years of national income, we write $\beta = 6$ (or $\beta = 600\%$).

In the developed countries today, the capital/income ratio generally varies between 5 and 6, and the capital stock consists almost entirely of private capital. In France and Britain, Germany and Italy, the United States and Japan, national income was roughly 30,000–35,000 euros per capita in 2010, whereas total private wealth (net of debt) was typically on the order of 150,000–200,000 euros per capita, or five to six times annual national income. There are interesting variations both within Europe and around the world. For instance, β is greater than 6 in Japan and Italy and less than 5 in the United States and Germany. Public wealth is just barely positive in some countries

and slightly negative in others. And so on. I examine all this in detail in the next few chapters. At this point, it is enough to keep these orders of magnitude in mind, in order to make the ideas as concrete as possible.¹⁰

The fact that national income in the wealthy countries of the world in 2010 was on the order of 30,000 euros per capita per annum (or 2,500 euros per month) obviously does not mean that everyone earns that amount. Like all averages, this average income figure hides enormous disparities. In practice, many people earn much less than 2,500 euros a month, while others earn dozens of times that much. Income disparities are partly the result of unequal pay for work and partly of much larger inequalities in income from capital, which are themselves a consequence of the extreme concentration of wealth. The average national income per capita is simply the amount that one could distribute to each individual if it were possible to equalize the income distribution without altering total output or national income.¹¹

Similarly, private per capita wealth on the order of 180,000 euros, or six years of national income, does not mean that everyone owns that much capital. Many people have much less, while some own millions or tens of millions of euros' worth of capital assets. Much of the population has very little accumulated wealth—significantly less than one year's income: a few thousand euros in a bank account, the equivalent of a few weeks' or months' worth of wages. Some people even have negative wealth: in other words, the goods they own are worth less than the debts they owe. By contrast, others have considerable fortunes, ranging from ten to twenty times their annual income or even more. The capital/income ratio for the country as a whole tells us nothing about inequalities within the country. But β does measure the overall importance of capital in a society, so analyzing this ratio is a necessary first step in the study of inequality. The main purpose of Part Two is to understand how and why the capital/income ratio varies from country to country, and how it has evolved over time.

To appreciate the concrete form that wealth takes in today's world, it is useful to note that the capital stock in the developed countries currently consists of two roughly equal shares: residential capital and professional capital used by firms and government. To sum up, each citizen of one of the wealthy countries earned an average of 30,000 euros per year in 2010, owned approximately 180,000 euros of capital, 90,000 in the form of a dwelling and another 90,000 in stocks, bonds, savings, or other investments.¹² There are interesting

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variations across countries, which I will analyze in Chapter 2. For now, the fact that capital can be divided into two roughly equal shares will be useful to keep in mind.

The First Fundamental Law of Capitalism: $\alpha = r \times \beta$

I can now present the first fundamental law of capitalism, which links the capital stock to the flow of income from capital. The capital/income ratio β is related in a simple way to the share of income from capital in national income, denoted α . The formula is

$$\alpha = r \times \beta$$

where r is *the rate of return on capital*.

For example, if $\beta = 600\%$ and $r = 5\%$, then $\alpha = r \times \beta = 30\%$.¹³

In other words, if national wealth represents the equivalent of six years of national income, and if the rate of return on capital is 5 percent per year, then capital's share in national income is 30 percent.

The formula $\alpha = r \times \beta$ is a pure accounting identity. It can be applied to all societies in all periods of history, by definition. Though tautological, it should nevertheless be regarded as the first fundamental law of capitalism, because it expresses a simple, transparent relationship among the three most important concepts for analyzing the capitalist system: the capital/income ratio, the share of capital in income, and the rate of return on capital.

The rate of return on capital is a central concept in many economic theories. In particular, Marxist analysis emphasizes the falling rate of profit—a historical prediction that turned out to be quite wrong, although it does contain an interesting intuition. The concept of the rate of return on capital also plays a central role in many other theories. In any case, the rate of return on capital measures the yield on capital over the course of a year regardless of its legal form (profits, rents, dividends, interest, royalties, capital gains, etc.), expressed as a percentage of the value of capital invested. It is therefore a broader notion than the “rate of profit,”¹⁴ and much broader than the “rate of interest,”¹⁵ while incorporating both.

Obviously, the rate of return can vary widely, depending on the type of investment. Some firms generate rates of return greater than 10 percent per

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year; others make losses (negative rate of return). The average long-run rate of return on stocks is 7–8 percent in many countries. Investments in real estate and bonds frequently return 3–4 percent, while the real rate of interest on public debt is sometimes much lower. The formula $\alpha = r \times \beta$ tells us nothing about these subtleties, but it does tell us how to relate these three quantities, which can be useful for framing discussion.

For example, in the wealthy countries around 2010, income from capital (profits, interests, dividends, rents, etc.) generally hovered around 30 percent of national income. With a capital/income ratio on the order of 600 percent, this meant that the rate of return on capital was around 5 percent.

Concretely, this means that the current per capita national income of 30,000 euros per year in rich countries breaks down as 21,000 euros per year income from labor (70 percent) and 9,000 euros income from capital (30 percent). Each citizen owns an average of 180,000 euros of capital, and the 9,000 euros of income from capital thus corresponds to an average annual return on capital of 5 percent.

Once again, I am speaking here only of averages: some individuals receive far more than 9,000 euros per year in income from capital, while others receive nothing while paying rent to their landlords and interest to their creditors. Considerable country-to-country variation also exists. In addition, measuring the share of income from capital is often difficult in both a conceptual and a practical sense, because there are some categories of income (such as nonwage self-employment income and entrepreneurial income) that are hard to break down into income from capital and income from labor. In some cases this can make comparison misleading. When such problems arise, the least imperfect method of measuring the capital share of income may be to apply a plausible average rate of return to the capital/income ratio. At this stage, the orders of magnitude given above ($\beta = 600\%$, $\alpha = 30\%$, $r = 5\%$) may be taken as typical.

For the sake of concreteness, let us note, too, that the average rate of return on land in rural societies is typically on the order of 4–5 percent. In the novels of Jane Austen and Honoré de Balzac, the fact that land (like government bonds) yields roughly 5 percent of the amount of capital invested (or, equivalently, that the value of capital corresponds to roughly twenty years of annual rent) is so taken for granted that it often goes unmentioned. Contemporary readers were well aware that it took capital on the order of 1 million francs to produce an annual rent of 50,000 francs. For nineteenth-century novelists

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and their readers, the relation between capital and annual rent was self-evident, and the two measuring scales were used interchangeably, as if rent and capital were synonymous, or perfect equivalents in two different languages.

Now, at the beginning of the twenty-first century, we find roughly the same return on real estate, 4–5 percent, sometimes a little less, especially where prices have risen rapidly without dragging rents upward at the same rate. For example, in 2010, a large apartment in Paris, valued at 1 million euros, typically rents for slightly more than 2,500 euros per month, or annual rent of 30,000 euros, which corresponds to a return on capital of only 3 percent per year from the landlord's point of view. Such a rent is nevertheless quite high for a tenant living solely on income from labor (one hopes he or she is paid well) while it represents a significant income for the landlord. The bad news (or good news, depending on your point of view) is that things have always been like this. This type of rent tends to rise until the return on capital is around 4 percent (which in this example would correspond to a rent of 3,000–3,500 euros per month, or 40,000 per year). Hence this tenant's rent is likely to rise in the future. The landlord's annual return on investment may eventually be enhanced by a long-term capital gain on the value of the apartment. Smaller apartments yield a similar or perhaps slightly higher return. An apartment valued at 100,000 euros may yield 400 euros a month in rent, or nearly 5,000 per year (5 percent). A person who owns such an apartment and chooses to live in it can save the rental equivalent and devote that money to other uses, which yields a similar return on investment.

Capital invested in businesses is of course at greater risk, so the average return is often higher. The stock-market capitalization of listed companies in various countries generally represents 12 to 15 years of annual profits, which corresponds to an annual return on investment of 6–8 percent (before taxes).

The formula $\alpha = r \times \beta$ allows us to analyze the importance of capital for an entire country or even for the planet as a whole. It can also be used to study the accounts of a specific company. For example, take a firm that uses capital valued at 5 million euros (including offices, infrastructure, machinery, etc.) to produce 1 million euros worth of goods annually, with 600,000 euros going to pay workers and 400,000 euros in profits.¹⁶ The capital/income ratio of this company is $\beta = 5$ (its capital is equivalent to five years of output), the capital share α is 40 percent, and the rate of return on capital is $r = 8$ percent.

Imagine another company that uses less capital (3 million euros) to produce the same output (1 million euros), but using more labor (700,000 euros in wages, 300,000 in profits). For this company, $\beta = 3$, $\alpha = 30$ percent, and $r = 10$ percent. The second firm is less capital intensive than the first, but it is more profitable (the rate of return on its capital is significantly higher).

In all countries, the magnitudes of β , α , and r vary a great deal from company to company. Some sectors are more capital intensive than others: for example, the metal and energy sectors are more capital intensive than the textile and food processing sectors, and the manufacturing sector is more capital intensive than the service sector. There are also significant variations between firms in the same sector, depending on their choice of production technology and market position. The levels of β , α , and r in a given country also depend on the relative shares of residential real estate and natural resources in total capital.

It bears emphasizing that the law $\alpha = r \times \beta$ does not tell us how each of these three variables is determined, or, in particular, how the national capital/income ratio (β) is determined, the latter being in some sense a measure of how intensely capitalistic the society in question is. To answer that question, we must introduce additional ideas and relationships, in particular the savings and investment rates and the rate of growth. This will lead us to the second fundamental law of capitalism: the higher the savings rate and the lower the growth rate, the higher the capital/income ratio (β). This will be shown in the next few chapters; at this stage, the law $\alpha = r \times \beta$ simply means that regardless of what economic, social, and political forces determine the level of the capital/income ratio (β), capital's share in income (α), and the rate of return on capital (r), these three variables are not independent of one another. Conceptually, there are two degrees of freedom, not three.

National Accounts: An Evolving Social Construct

Now that the key concepts of output and income, capital and wealth, capital/income ratio, and rate of return on capital have been explained, I will examine in greater detail how these abstract quantities can be measured and what such measurements can tell us about the historical evolution of the distribution of wealth in various countries. I will briefly review the main stages in the history of national accounts and then present a portrait in broad brushstrokes of how the global distribution of output and income has changed since the

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eighteenth century, along with a discussion of how demographic and economic growth rates have changed over the same period. These growth rates will play an important part in the analysis.

As noted, the first attempts to measure national income and capital date back to the late seventeenth and early eighteenth century. Around 1700, several isolated estimates appeared in Britain and France (apparently independently of one another). I am speaking primarily of the work of William Petty (1664) and Gregory King (1696) for England and Pierre le Pesant, sieur de Boisguillebert (1695), and Sébastien Le Prestre de Vauban (1707) for France. Their work focused on both the national stock of capital and the annual flow of national income. One of their primary objectives was to calculate the total value of land, by far the most important source of wealth in the agrarian societies of the day, and then to relate the quantity of landed wealth to the level of agricultural output and land rents.

It is worth noting that these authors often had a political objective in mind, generally having to do with modernization of the tax system. By calculating the nation's income and wealth, they hoped to show the sovereign that it would be possible to raise tax receipts considerably while keeping tax rates relatively low, provided that all property and goods produced were subject to taxation and everyone was required to pay, including landlords of both aristocratic and common descent. This objective is obvious in Vauban's *Projet de dime royale* (Plan for a Royal Tithe), but it is just as clear in the works of Boisguillebert and King (though less so in Petty's writing).

The late eighteenth century saw further attempts to measure income and wealth, especially around the time of the French Revolution. Antoine Lavoisier published his estimates for the year 1789 in his book *La Richesse territoriale du Royaume de France* (The Territorial Wealth of the Kingdom of France), published in 1791. The new tax system established after the Revolution, which ended the privileges of the nobility and imposed a tax on all property in land, was largely inspired by this work, which was widely used to estimate expected receipts from new taxes.

It was above all in the nineteenth century, however, that estimates of national wealth proliferated. From 1870 to 1900, Robert Giffen regularly updated his estimates of Britain's stock of national capital, which he compared to estimates by other authors (especially Patrick Colquhoun) from the early 1800s. Giffen marveled at the size of Britain's stock of industrial capital as

well as the stock of foreign assets acquired since the Napoleonic wars, which was many times larger than the entire public debt due to those wars.¹⁷ In France at about the same time, Alfred de Foville and Clément Colson published estimates of “national wealth” and “private wealth,” and, like Giffen, both writers also marveled at the considerable accumulation of private capital over the course of the nineteenth century. It was glaringly obvious to everyone that private fortunes were prospering in the period 1870–1914. For the economists of the day, the problem was to measure that wealth and compare different countries (the Franco-British rivalry was never far from their minds). Until World War I, estimates of wealth received much more attention than estimates of income and output, and there were in any case more of them, not only in Britain and France but also in Germany, the United States, and other industrial powers. In those days, being an economist meant first and foremost being able to estimate the national capital of one’s country: this was almost a rite of initiation.

It was not until the period between the two world wars that national accounts began to be established on an annual basis. Previous estimates had always focused on isolated years, with successive estimates separated by ten or more years, as in the case of Giffen’s calculations of British national capital in the nineteenth century. In the 1930s, improvements in the primary statistical sources made the first annual series of national income data possible. These generally went back as far as the beginning of the twentieth century or the last decades of the nineteenth. They were established for the United States by Kuznets and Kendrick, for Britain by Bowley and Clark, and for France by Dugé de Bernonville. After World War II, government statistical offices supplanted economists and began to compile and publish official annual data on GDP and national income. These official series continue to this day.

Compared with the pre-World War I period, however, the focal point of the data had changed entirely. From the 1940s on, the primary motivation was to respond to the trauma of the Great Depression, during which governments had no reliable annual estimates of economic output. There was therefore a need for statistical and political tools in order to steer the economy properly and avoid a repeat of the catastrophe. Governments thus insisted on annual or even quarterly data on output and income. Estimates of national wealth, which had been so prized before 1914, now took a backseat, especially after the economic and political chaos of 1914–1945 made it difficult to interpret their meaning. Specifically, the prices of real estate and financial assets

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fell to extremely low levels, so low that private capital seemed to have evaporated. In the 1950s and 1960s, a period of reconstruction, the main goal was to measure the remarkable growth of output in various branches of industry.

In the 1990s–2000s, wealth accounting again came to the fore. Economists and political leaders were well aware that the financial capitalism of the twenty-first century could not be properly analyzed with the tools of the 1950s and 1960s. In collaboration with central banks, government statistical agencies in various developed countries compiled and published annual series of data on the assets and liabilities of different groups, in addition to the usual income and output data. These wealth accounts are still far from perfect: for example, natural capital and damages to the environment are not well accounted for. Nevertheless, they represent real progress in comparison with national accounts from the early postwar years, which were concerned solely with endless growth in output.¹⁸ These are the official series that I use in this book to analyze aggregate wealth and the current capital/income ratio in the wealthy countries.

One conclusion stands out in this brief history of national accounting: national accounts are a social construct in perpetual evolution. They always reflect the preoccupations of the era when they were conceived.¹⁹ We should be careful not to make a fetish of the published figures. When a country's national income per capita is said to be 30,000 euros, it is obvious that this number, like all economic and social statistics, should be regarded as an estimate, a construct, and not a mathematical certainty. It is simply the best estimate we have. National accounts represent the only consistent, systematic attempt to analyze a country's economic activity. They should be regarded as a limited and imperfect research tool, a compilation and arrangement of data from highly disparate sources. In all developed countries, national accounts are currently compiled by government statistical offices and central banks from the balance sheets and account books of financial and nonfinancial corporations together with many other statistical sources and surveys. We have no reason to think a priori that the officials involved in these efforts do not do their best to spot inconsistencies in the data in order to achieve the best possible estimates. Provided we use these data with caution and in a critical spirit and complement them with other data where there are errors or gaps (say, in

dealing with tax havens), these national accounts are an indispensable tool for estimating aggregate income and wealth.

In particular, as I will show in Part Two, we can put together a consistent analysis of the historical evolution of the capital/income ratio by meticulously compiling and comparing national wealth estimates by many authors from the eighteenth to the early twentieth century and connecting them up with official capital accounts from the late twentieth and early twenty-first century. The other major limitation of official national accounts, apart from their lack of historical perspective, is that they are deliberately concerned only with aggregates and averages and not with distributions and inequalities. We must therefore draw on other sources to measure the distribution of income and wealth and to study inequalities. National accounts thus constitute a crucial element of our analyses, but only when completed with additional historical and distributional data.

The Global Distribution of Production

I begin by examining the evolution of the global distribution of production, which is relatively well known from the early nineteenth century on. For earlier periods, estimates are more approximate, but we know the broad outlines, thanks most notably to the historical work of Angus Maddison, especially since the overall pattern is relatively simple.²⁰

From 1900 to 1980, 70–80 percent of the global production of goods and services was concentrated in Europe and America, which incontestably dominated the rest of the world. By 2010, the European–American share had declined to roughly 50 percent, or approximately the same level as in 1860. In all probability, it will continue to fall and may go as low as 20–30 percent at some point in the twenty-first century. This was the level maintained up to the turn of the nineteenth century and would be consistent with the European–American share of the world’s population (see Figures 1.1 and 1.2).

In other words, the lead that Europe and America achieved during the Industrial Revolution allowed these two regions to claim a share of global output that was two to three times greater than their share of the world’s population simply because their output per capita was two to three times

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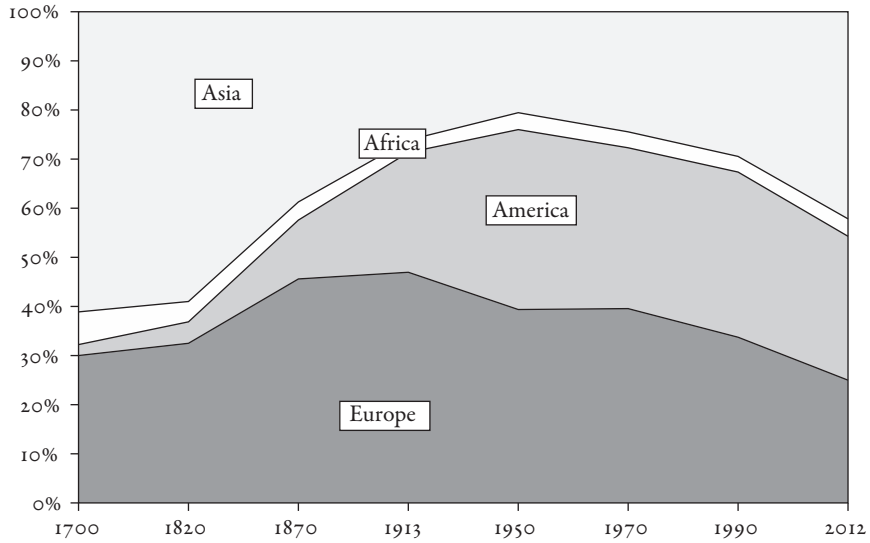


FIGURE 1.1. The distribution of world output, 1700–2012

Europe’s GDP made 47 percent of world GDP in 1913, down to 25 percent in 2012. Sources and series: see piketty.pse.ens.fr/capital21c.

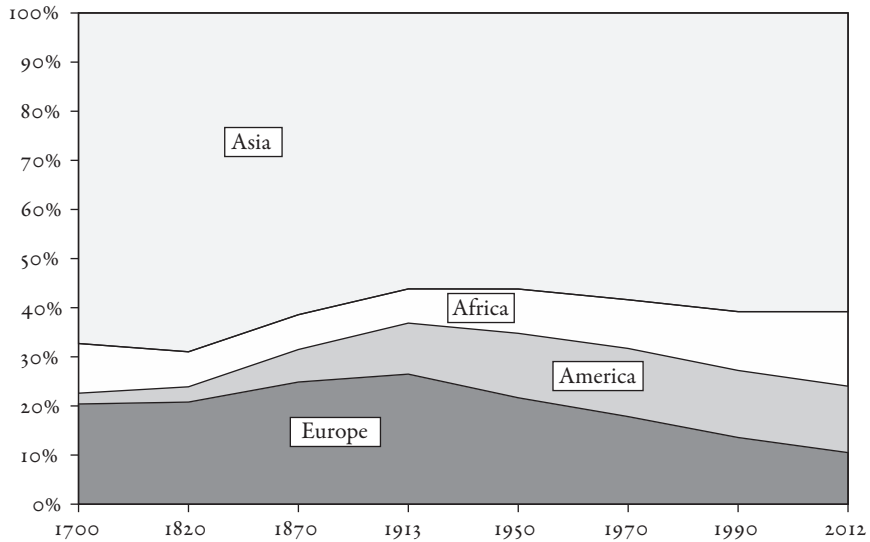


FIGURE 1.2. The distribution of world population, 1700–2012

Europe’s population made 26 percent of world population in 1913, down to 10 percent in 2012.

Sources and series: see piketty.pse.ens.fr/capital21c.

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INCOME AND OUTPUT

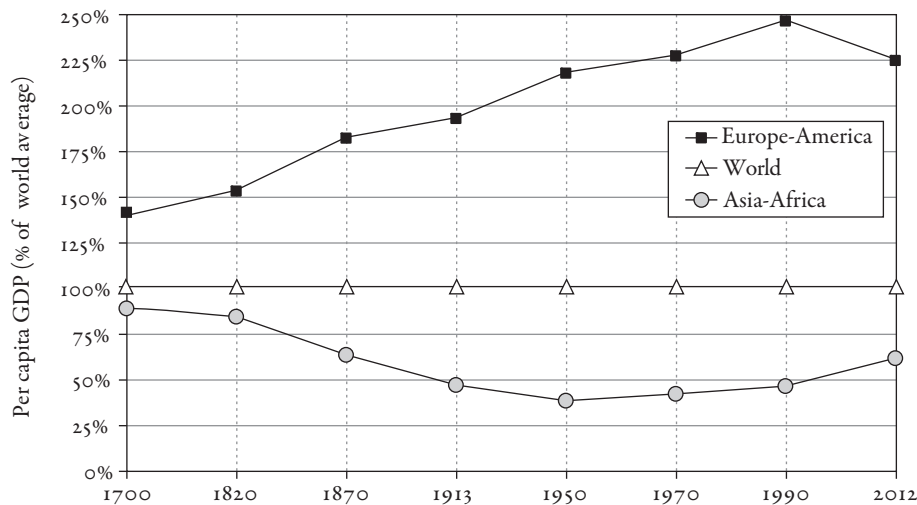


FIGURE 1.3. Global inequality 1700–2012: divergence then convergence?

Per capita GDP in Asia-Africa went from 37 percent of world average in 1950 to 61 percent in 2012.

Sources and series: see piketty.pse.ens.fr/capital21c.

greater than the global average.²¹ All signs are that this phase of divergence in per capita output is over and that we have embarked on a period of convergence. The resulting “catch-up” phenomenon is far from over, however (see Figure 1.3). It is far too early to predict when it might end, especially since the possibility of economic and/or political reversals in China and elsewhere obviously cannot be ruled out.

From Continental Blocs to Regional Blocs

The general pattern just described is well known, but a number of points need to be clarified and refined. First, putting Europe and the Americas together as a single “Western bloc” simplifies the presentation but is largely artificial. Europe attained its maximal economic weight on the eve of World War I, when it accounted for nearly 50 percent of global output, and it has declined steadily since then, whereas America attained its peak in the 1950s, when it accounted for nearly 40 percent of global output.

Furthermore, both Europe and the Americas can be broken down into two highly unequal subregions: a hyperdeveloped core and a less developed

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periphery. Broadly speaking, global inequality is best analyzed in terms of regional blocs rather than continental blocs. This can be seen clearly in Table 1.1, which shows the distribution of global output in 2012. All these numbers are of no interest in themselves, but it is useful to familiarize oneself with the principal orders of magnitude.

The population of the planet is close to 7 billion in 2012, and global output is slightly greater than 70 trillion euros, so that global output per capita is almost exactly 10,000 euros. If we subtract 10 percent for capital depreciation and divide by 12, we find that this yields an average per capita monthly income of 760 euros, which may be a clearer way of making the point. In other words, if global output and the income to which it gives rise were equally divided, each individual in the world would have an income of about 760 euros per month.

The population of Europe is about 740 million, about 540 million of whom live in member countries of the European Union, whose per capita output exceeds 27,000 euros per year. The remaining 200 million people live in Russia and Ukraine, where the per capita output is about 15,000 euros per year, barely 50 percent above the global average.²² The European Union itself is relatively heterogeneous: 410 million of its citizens live in what used to be called Western Europe, three-quarters of them in the five most populous countries of the Union, namely Germany, France, Great Britain, Italy, and Spain, with an average per capita GDP of 31,000 euros per year, while the remaining 130 million live in what used to be Eastern Europe, with an average per capita output on the order of 16,000 euros per year, not very different from the Russia-Ukraine bloc.²³

The Americas can also be divided into distinct regions that are even more unequal than the European center and periphery: the US-Canada bloc has 350 million people with a per capita output of 40,000 euros, while Latin America has 600 million people with a per capita output of 10,000 euros, exactly equal to the world average.

Sub-Saharan Africa, with a population of 900 million and an annual output of only 1.8 trillion euros (less than the French GDP of 2 trillion), is economically the poorest region of the world, with a per capita output of only 2,000 euros per year. India is slightly higher, while North Africa does markedly better, and China even better than that: with a per capita output of

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TABLE I.1.
Distribution of world GDP, 2012.

Region	Population (million inhabitants)	GDP (billion euros 2012)	Per capita GDP (euros 2012)	Equivalent per capita monthly income (euros 2012)
World	7,050	71,200	10,100	760
Europe	740	17,800	24,000	1,800
incl. European Union	540	14,700	27,300	2,040
incl. Russia/Ukraine	200	3,100	15,400	1,150
America	950	20,600	21,500	1,620
incl. United States/Canada	350	14,300	40,700	3,050
incl. Latin America	600	6,300	10,400	780
Africa	1,070	2,800	2,600	200
incl. North Africa	170	1,000	5,700	430
incl. Sub-Saharan Africa	900	1,800	2,000	150
Asia	4,290	30,000	7,000	520
incl. China	1,350	10,400	7,700	580
incl. India	1,260	4,000	3,200	240
incl. Japan	130	3,800	30,000	2,250
incl. other	1,550	11,800	7,600	570

Note: World GDP, estimated in purchasing power parity, was about 71,200 billion euros in 2012. World population was about 7,050 billion inhabitants, hence a per capita GDP of €10,100 (equivalent to a monthly income of about €760 per month). All numbers were rounded to the closed dozen or hundred.

Sources: See piketty.pse.ens.fr/capital21c.

8,000 euros per year, China in 2012 is not far below the world average. Japan's annual per capita output is equal to that of the wealthiest European countries (approximately 30,000 euros), but its population is such a small minority in the greater Asian population that it has little influence on the continental average, which is close to that of China.²⁴

*Global Inequality: From 150 Euros per Month to
3,000 Euros per Month*

To sum up, global inequality ranges from regions in which the per capita income is on the order of 150–250 euros per month (sub-Saharan Africa, India) to regions where it is as high as 2,500–3,000 euros per month (Western Europe, North America, Japan), that is, ten to twenty times higher. The global average, which is roughly equal to the Chinese average, is around 600–800 euros per month.

These orders of magnitude are significant and worth remembering. Bear in mind, however, that the margin of error in these figures is considerable: it is always much more difficult to measure inequalities between countries (or between different periods) than within them.

For example, global inequality would be markedly higher if we used current exchange rates rather than purchasing power parities, as I have done thus far. To understand what these terms mean, first consider the euro/dollar exchange rate. In 2012, a euro was worth about \$1.30 on the foreign exchange market. A European with an income of 1,000 euros per month could go to his or her bank and exchange that amount for \$1,300. If that person then took that money to the United States to spend, his or her purchasing power would be \$1,300. But according to the official International Comparison Program (ICP), European prices are about 10 percent higher than American prices, so that if this same European spent the same money in Europe, his or her purchasing power would be closer to an American income of \$1,200. Thus we say that \$1.20 has “purchasing power parity” with 1 euro. I used this parity rather than the exchange rate to convert American GDP to euros in Table 1.1, and I did the same for the other countries listed. In other words, we compare the GDP of different countries on the basis of the actual purchasing power of their citizens, who generally spend their income at home rather than abroad.²⁵

INCOME AND OUTPUT

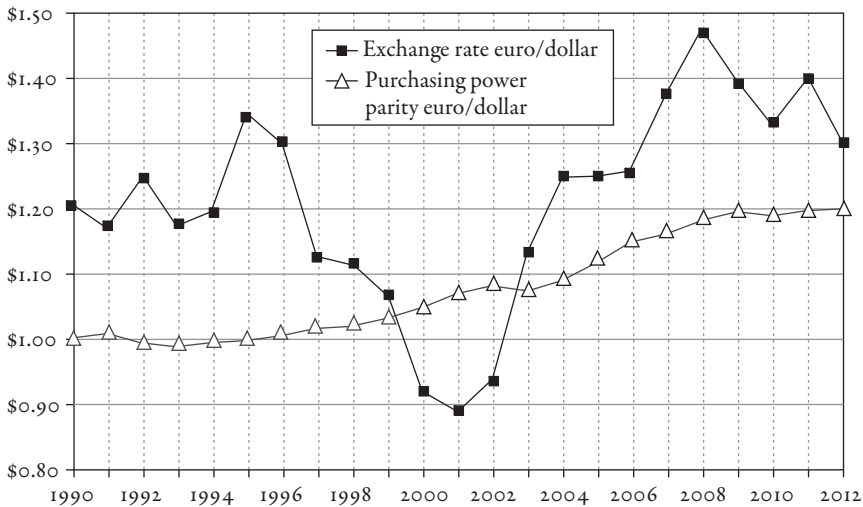


FIGURE 1.4. Exchange rate and purchasing power parity: euro/dollar

In 2012, 1 euro was worth \$1.30 according to current exchange rate, but \$1.20 in purchasing power parity.

Sources and series: see piketty.pse.ens.fr/capital21c.

The other advantage of using purchasing power parities is that they are more stable than exchange rates. Indeed, exchange rates reflect not only the supply and demand for the goods and services of different countries but also sudden changes in the investment strategies of international investors and volatile estimates of the political and/or financial stability of this or that country, to say nothing of unpredictable changes in monetary policy. Exchange rates are therefore extremely volatile, as a glance at the large fluctuations of the dollar over the past few decades will show. The dollar/euro rate went from \$1.30 per euro in the 1990s to less than \$0.90 in 2001 before rising to around \$1.50 in 2008 and then falling back to \$1.30 in 2012. During that time, the purchasing power parity of the euro rose gently from roughly \$1 per euro in the early 1990s to roughly \$1.20 in 2010 (see Figure 1.4).²⁶

Despite the best efforts of the international organizations involved in the ICP, there is no escaping the fact that these purchasing power parity estimates are rather uncertain, with margins of error on the order of 10 percent if not higher, even between countries at comparable levels of development. For example, the most recent available survey shows that while some European prices (for energy, housing, hotels, and restaurants) are indeed higher than

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comparable American prices, others are sharply lower (for health and education, for instance).²⁷ In theory, the official estimates weight all prices according to the weight of various goods and services in a typical budget for each country, but such calculations clearly leave a good deal of room for error, particularly since it is very hard to measure qualitative differences for many services. In any case, it is important to emphasize that each of these price indices measures a different aspect of social reality. The price of energy measures purchasing power for energy (which is greater in the United States), while the price of health care measures purchasing power in that area (which is greater in Europe). The reality of inequality between countries is multidimensional, and it is misleading to say that it can all be summed up with a single index leading to an unambiguous classification, especially between countries with fairly similar average incomes.

In the poorer countries, the corrections introduced by purchasing power parity are even larger: in Africa and Asia, prices are roughly half what they are in the rich countries, so that GDP roughly doubles when purchasing power parity is used for comparisons rather than the market exchange rate. This is chiefly a result of the fact that the prices of goods and services that cannot be traded internationally are lower, because these are usually relatively labor intensive and involve relatively unskilled labor (a relatively abundant factor of production in less developed countries), as opposed to skilled labor and capital (which are relatively scarce in less developed countries).²⁸ Broadly speaking, the poorer a country is, the greater the correction: in 2012, the correction coefficient was 1.6 in China and 2.5 in India.²⁹ At this moment, the euro is worth 8 Chinese yuan on the foreign exchange market but only 5 yuan in purchasing power parity. The gap is shrinking as China develops and revalues the yuan (see Figure 1.5). Some writers, including Angus Maddison, argue that the gap is not as small as it might appear and that official international statistics underestimate Chinese GDP.³⁰

Because of the uncertainties surrounding exchange rates and purchasing power parities, the average per capita monthly incomes discussed earlier (150–250 euros for the poorest countries, 600–800 euros for middling countries, and 2,500–3,000 euros for the richest countries) should be treated as approximations rather than mathematical certainties. For example, the share of the rich countries (European Union, United States, Canada, and Japan) in global income was 46 percent in 2012 if we use purchasing power parity but 57 per-

INCOME AND OUTPUT

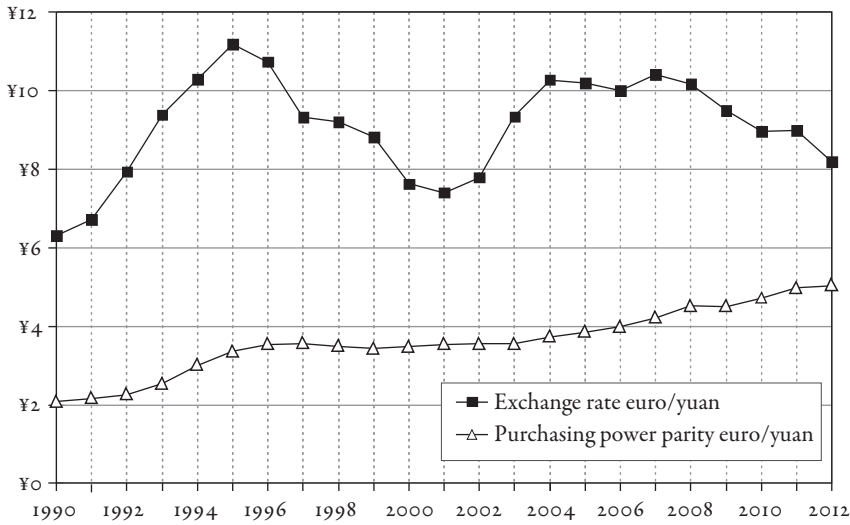


FIGURE 1.5. Exchange rate and purchasing power parity: euro/yuan

In 2012, one euro was worth eight yuan according to current exchange rate, but five yuan in purchasing power parity.

Sources and series: see piketty.pse.ens.fr/capital21c.

cent if we use current exchange rates.³¹ The “truth” probably lies somewhere between these two figures and is probably closer to the first. Still, the orders of magnitude remain the same, as does the fact that the share of income going to the wealthy countries has been declining steadily since the 1970s. Regardless of what measure is used, the world clearly seems to have entered a phase in which rich and poor countries are converging in income.

The Global Distribution of Income Is More Unequal Than the Distribution of Output

To simplify the exposition, the discussion thus far has assumed that the national income of each continental or regional grouping coincided with its domestic product: the monthly incomes indicated in Table 1.1 were obtained simply by deducting 10 percent from GDP (to account for depreciation of capital) and dividing by twelve.

In fact, it is valid to equate income and output only at the global level and not at the national or continental level. Generally speaking, the global income

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distribution is more unequal than the output distribution, because the countries with the highest per capita output are also more likely to own part of the capital of other countries and therefore to receive a positive flow of income from capital originating in countries with a lower level of per capita output. In other words, the rich countries are doubly wealthy: they both produce more at home and invest more abroad, so that their national income per head is greater than their output per head. The opposite is true for poor countries.

More specifically, all of the major developed countries (the United States, Japan, Germany, France, and Britain) currently enjoy a level of national income that is slightly greater than their domestic product. As noted, however, net income from abroad is just slightly positive and does not radically alter the standard of living in these countries. It amounts to about 1 or 2 percent of GDP in the United States, France, and Britain and 2–3 percent of GDP in Japan and Germany. This is nevertheless a significant boost to national income, especially for Japan and Germany, whose trade surpluses have enabled them to accumulate over the past several decades substantial reserves of foreign capital, the return on which is today considerable.

I turn now from the wealthiest countries taken individually to continental blocs taken as a whole. What we find in Europe, America, and Asia is something close to equilibrium: the wealthier countries in each bloc (generally in the north) receive a positive flow of income from capital, which is partly canceled by the flow out of other countries (generally in the south and east), so that at the continental level, total income is almost exactly equal to total output, generally within 0.5 percent.³²

The only continent not in equilibrium is Africa, where a substantial share of capital is owned by foreigners. According to the balance of payments data compiled since 1970 by the United Nations and other international organizations such as the World Bank and International Monetary Fund, the income of Africans is roughly 5 percent less than the continent's output (and as high as 10 percent lower in some individual countries).³³ With capital's share of income at about 30 percent, this means that nearly 20 percent of African capital is owned by foreigners: think of the London stockholders of the Marikana platinum mine discussed at the beginning of this chapter.

It is important to realize what such a figure means in practice. Since some kinds of wealth (such as residential real estate and agricultural capital) are rarely owned by foreign investors, it follows that the foreign-owned share of

Africa's manufacturing capital may exceed 40–50 percent and may be higher still in other sectors. Despite the fact that there are many imperfections in the balance of payments data, foreign ownership is clearly an important reality in Africa today.

If we look back farther in time, we find even more marked international imbalances. On the eve of World War I, the national income of Great Britain, the world's leading investor, was roughly 10 percent above its domestic product. The gap was more than 5 percent in France, the number two colonial power and global investor, and Germany was a close third, even though its colonial empire was insignificant, because its highly developed industrial sector accumulated large claims on the rest of the world. British, French, and German investment went partly to other European countries and the United States and partly to Asia and Africa. Overall, the European powers in 1913 owned an estimated one-third to one-half of the domestic capital of Asia and Africa and more than three-quarters of their industrial capital.³⁴

What Forces Favor Convergence?

In theory, the fact that the rich countries own part of the capital of poor countries can have virtuous effects by promoting convergence. If the rich countries are so flush with savings and capital that there is little reason to build new housing or add new machinery (in which case economists say that the “marginal productivity of capital,” that is, the additional output due to adding one new unit of capital “at the margin,” is very low), it can be collectively efficient to invest some part of domestic savings in poorer countries abroad. Thus the wealthy countries—or at any rate the residents of wealthy countries with capital to spare—will obtain a better return on their investment by investing abroad, and the poor countries will increase their productivity and thus close the gap between them and the rich countries. According to classical economic theory, this mechanism, based on the free flow of capital and equalization of the marginal productivity of capital at the global level, should lead to convergence of rich and poor countries and an eventual reduction of inequalities through market forces and competition.

This optimistic theory has two major defects, however. First, from a strictly logical point of view, the equalization mechanism does not guarantee global convergence of per capita income. At best it can give rise to convergence

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of per capita output, provided we assume perfect capital mobility and, even more important, total equality of skill levels and human capital across countries—no small assumption. In any case, the possible convergence of output per head does *not* imply convergence of income per head. After the wealthy countries have invested in their poorer neighbors, they may continue to own them indefinitely, and indeed their share of ownership may grow to massive proportions, so that the per capita national income of the wealthy countries remains permanently greater than that of the poorer countries, which must continue to pay to foreigners a substantial share of what their citizens produce (as African countries have done for decades). In order to determine how likely such a situation is to arise, we must compare the rate of return on capital that the poor countries must pay to the rich to the growth rates of rich and poor economies. Before proceeding down this road, we must first gain a better understanding of the dynamics of the capital/income ratio within a given country.

Furthermore, if we look at the historical record, it does not appear that capital mobility has been the primary factor promoting convergence of rich and poor nations. None of the Asian countries that have moved closer to the developed countries of the West in recent years has benefited from large foreign investments, whether it be Japan, South Korea, or Taiwan and more recently China. In essence, all of these countries themselves financed the necessary investments in physical capital and, even more, in human capital, which the latest research holds to be the key to long-term growth.³⁵ Conversely, countries owned by other countries, whether in the colonial period or in Africa today, have been less successful, most notably because they have tended to specialize in areas without much prospect of future development and because they have been subject to chronic political instability.

Part of the reason for that instability may be the following. When a country is largely owned by foreigners, there is a recurrent and almost irrepressible social demand for expropriation. Other political actors respond that investment and development are possible only if existing property rights are unconditionally protected. The country is thus caught in an endless alternation between revolutionary governments (whose success in improving actual living conditions for their citizens is often limited) and governments dedicated to the protection of existing property owners, thereby laying the groundwork for the next revolution or coup. Inequality of capital ownership is already dif-

difficult to accept and peacefully maintain within a single national community. Internationally, it is almost impossible to sustain without a colonial type of political domination.

Make no mistake: participation in the global economy is not negative in itself. Autarky has never promoted prosperity. The Asian countries that have lately been catching up with the rest of the world have clearly benefited from openness to foreign influences. But they have benefited far more from open markets for goods and services and advantageous terms of trade than from free capital flows. China, for example, still imposes controls on capital: foreigners cannot invest in the country freely, but that has not hindered capital accumulation, for which domestic savings largely suffice. Japan, South Korea, and Taiwan all financed investment out of savings. Many studies also show that gains from free trade come mainly from the diffusion of knowledge and from the productivity gains made necessary by open borders, not from static gains associated with specialization, which appear to be fairly modest.³⁶

To sum up, historical experience suggests that the principal mechanism for convergence at the international as well as the domestic level is the diffusion of knowledge. In other words, the poor catch up with the rich to the extent that they achieve the same level of technological know-how, skill, and education, not by becoming the property of the wealthy. The diffusion of knowledge is not like manna from heaven: it is often hastened by international openness and trade (autarky does not encourage technological transfer). Above all, knowledge diffusion depends on a country's ability to mobilize financing as well as institutions that encourage large-scale investment in education and training of the population while guaranteeing a stable legal framework that various economic actors can reliably count on. It is therefore closely associated with the achievement of legitimate and efficient government. Concisely stated, these are the main lessons that history has to teach about global growth and international inequalities.

Conclusion

I have presented the current state of our historical knowledge concerning the dynamics of the distribution of wealth and income since the eighteenth century, and I have attempted to draw from this knowledge whatever lessons can be drawn for the century ahead.

The sources on which this book draws are more extensive than any previous author has assembled, but they remain imperfect and incomplete. All of my conclusions are by nature tenuous and deserve to be questioned and debated. It is not the purpose of social science research to produce mathematical certainties that can substitute for open, democratic debate in which all shades of opinion are represented.

The Central Contradiction of Capitalism: $r > g$

The overall conclusion of this study is that a market economy based on private property, if left to itself, contains powerful forces of convergence, associated in particular with the diffusion of knowledge and skills; but it also contains powerful forces of divergence, which are potentially threatening to democratic societies and to the values of social justice on which they are based.

The principal destabilizing force has to do with the fact that the private rate of return on capital, r , can be significantly higher for long periods of time than the rate of growth of income and output, g .

The inequality $r > g$ implies that wealth accumulated in the past grows more rapidly than output and wages. This inequality expresses a fundamental logical contradiction. The entrepreneur inevitably tends to become a rentier, more and more dominant over those who own nothing but their labor. Once constituted, capital reproduces itself faster than output increases. The past devours the future.

The consequences for the long-term dynamics of the wealth distribution are potentially terrifying, especially when one adds that the return on capital varies directly with the size of the initial stake and that the divergence in the wealth distribution is occurring on a global scale.

The problem is enormous, and there is no simple solution. Growth can of course be encouraged by investing in education, knowledge, and nonpolluting technologies. But none of these will raise the growth rate to 4 or 5 percent a year. History shows that only countries that are catching up with more advanced economies—such as Europe during the three decades after World War II or China and other emerging countries today—can grow at such rates. For countries at the world technological frontier—and thus ultimately for the planet as a whole—there is ample reason to believe that the growth rate will not exceed 1–1.5 percent in the long run, no matter what economic policies are adopted.¹

With an average return on capital of 4–5 percent, it is therefore likely that $r > g$ will again become the norm in the twenty-first century, as it had been throughout history until the eve of World War I. In the twentieth century, it took two world wars to wipe away the past and significantly reduce the return on capital, thereby creating the illusion that the fundamental structural contradiction of capitalism ($r > g$) had been overcome.

To be sure, one could tax capital income heavily enough to reduce the private return on capital to less than the growth rate. But if one did that indiscriminately and heavy-handedly, one would risk killing the motor of accumulation and thus further reducing the growth rate. Entrepreneurs would then no longer have the time to turn into rentiers, since there would be no more entrepreneurs.

The right solution is a progressive annual tax on capital. This will make it possible to avoid an endless inegalitarian spiral while preserving competition and incentives for new instances of primitive accumulation. For example, I earlier discussed the possibility of a capital tax schedule with rates of 0.1 or 0.5 percent on fortunes under 1 million euros, 1 percent on fortunes between 1 and 5 million euros, 2 percent between 5 and 10 million euros, and as high as 5 or 10 percent for fortunes of several hundred million or several billion euros. This would contain the unlimited growth of global inequality of wealth, which is currently increasing at a rate that cannot be sustained in the long run and that ought to worry even the most fervent champions of the self-regulated market. Historical experience shows, moreover, that such immense inequalities of wealth have little to do with the entrepreneurial spirit and are of no use in promoting growth. Nor are they of any “common utility,” to borrow the

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CONCLUSION

nice expression from the 1789 Declaration of the Rights of Man and the Citizen with which I began this book.

The difficulty is that this solution, the progressive tax on capital, requires a high level of international cooperation and regional political integration. It is not within the reach of the nation-states in which earlier social compromises were hammered out. Many people worry that moving toward greater cooperation and political integration within, say, the European Union only undermines existing achievements (starting with the social states that the various countries of Europe constructed in response to the shocks of the twentieth century) without constructing anything new other than a vast market predicated on ever purer and more perfect competition. Yet pure and perfect competition cannot alter the inequality $r > g$, which is not the consequence of any market “imperfection.” On the contrary. Although the risk is real, I do not see any genuine alternative: if we are to regain control of capitalism, we must bet everything on democracy—and in Europe, democracy on a European scale. Larger political communities such as the United States and China have a wider range of options, but for the small countries of Europe, which will soon look very small indeed in relation to the global economy, national withdrawal can only lead to even worse frustration and disappointment than currently exists with the European Union. The nation-state is still the right level at which to modernize any number of social and fiscal policies and to develop new forms of governance and shared ownership intermediate between public and private ownership, which is one of the major challenges for the century ahead. But only regional political integration can lead to effective regulation of the globalized patrimonial capitalism of the twenty-first century.

For a Political and Historical Economics

I would like to conclude with a few words about economics and social science. As I made clear in the introduction, I see economics as a subdiscipline of the social sciences, alongside history, sociology, anthropology, and political science. I hope that this book has given the reader an idea of what I mean by that. I dislike the expression “economic science,” which strikes me as terribly arrogant because it suggests that economics has attained a higher scientific

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status than the other social sciences. I much prefer the expression “political economy,” which may seem rather old-fashioned but to my mind conveys the only thing that sets economics apart from the other social sciences: its political, normative, and moral purpose.

From the outset, political economy sought to study scientifically, or at any rate rationally, systematically, and methodically, the ideal role of the state in the economic and social organization of a country. The question it asked was: What public policies and institutions bring us closer to an ideal society? This unabashed aspiration to study good and evil, about which every citizen is an expert, may make some readers smile. To be sure, it is an aspiration that often goes unfulfilled. But it is also a necessary, indeed indispensable, goal, because it is all too easy for social scientists to remove themselves from public debate and political confrontation and content themselves with the role of commentators on or demolishers of the views and data of others. Social scientists, like all intellectuals and all citizens, ought to participate in public debate. They cannot be content to invoke grand but abstract principles such as justice, democracy, and world peace. They must make choices and take stands in regard to specific institutions and policies, whether it be the social state, the tax system, or the public debt. Everyone is political in his or her own way. The world is not divided between a political elite on one side and, on the other, an army of commentators and spectators whose only responsibility is to drop a ballot in a ballot box once every four or five years. It is illusory, I believe, to think that the scholar and the citizen live in separate moral universes, the former concerned with means and the latter with ends. Although comprehensible, this view ultimately strikes me as dangerous.

For far too long economists have sought to define themselves in terms of their supposedly scientific methods. In fact, those methods rely on an immoderate use of mathematical models, which are frequently no more than an excuse for occupying the terrain and masking the vacuity of the content. Too much energy has been and still is being wasted on pure theoretical speculation without a clear specification of the economic facts one is trying to explain or the social and political problems one is trying to resolve. Economists today are full of enthusiasm for empirical methods based on controlled experiments. When used with moderation, these methods can be useful, and they deserve credit for turning some economists toward concrete questions and firsthand knowledge of the terrain (a long overdue development). But

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these new approaches themselves succumb at times to a certain scientific illusion. It is possible, for instance, to spend a great deal of time proving the existence of a pure and true causal relation while forgetting that the question itself is of limited interest. The new methods often lead to a neglect of history and of the fact that historical experience remains our principal source of knowledge. We cannot replay the history of the twentieth century as if World War I never happened or as if the income tax and PAYGO pensions were never created. To be sure, historical causality is always difficult to prove beyond a shadow of a doubt. Are we really certain that a particular policy had a particular effect, or was the effect perhaps due to some other cause? Nevertheless, the imperfect lessons that we can draw from history, and in particular from the study of the last century, are of inestimable, irreplaceable value, and no controlled experiment will ever be able to equal them. To be useful, economists must above all learn to be more pragmatic in their methodological choices, to make use of whatever tools are available, and thus to work more closely with other social science disciplines.

Conversely, social scientists in other disciplines should not leave the study of economic facts to economists and must not flee in horror the minute a number rears its head, or content themselves with saying that every statistic is a social construct, which of course is true but insufficient. At bottom, both responses are the same, because they abandon the terrain to others.

The Interests of the Least Well-Off

“As long as the incomes of the various classes of contemporary society remain beyond the reach of scientific inquiry, there can be no hope of producing a useful economic and social history.” This admirable sentence begins *Le mouvement du profit en France au 19e siècle*, which Jean Bouvier, François Furet, and Marcel Gillet published in 1965. The book is still worth reading, in part because it is a good example of the “serial history” that flourished in France between 1930 and 1980, with its characteristic virtues and flaws, but even more because it reminds us of the intellectual trajectory of François Furet, whose career offers a marvelous illustration of both the good and the bad reasons why this research program eventually died out.

When Furet began his career as a promising young historian, he chose a subject that he believed was at the center of contemporary research: “the incomes

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of the various classes of contemporary society.” The book is rigorous, eschews all prejudice, and seeks above all to collect data and establish facts. Yet this would be Furet’s first and last work in this realm. In the splendid book he published with Jacques Ozouf in 1977, *Lire et écrire*, devoted to “literacy in France from Calvin to Jules Ferry,” one finds the same eagerness to compile serial data, no longer about industrial profits but now about literacy rates, numbers of teachers, and educational expenditures. In the main, however, Furet became famous for his work on the political and cultural history of the French Revolution, in which one endeavors in vain to find any trace of the “incomes of the various classes of contemporary society,” and in which the great historian, preoccupied as he was in the 1970s with the battle he was waging against the Marxist historians of the French Revolution (who at the time were particularly dogmatic and clearly dominant, notably at the Sorbonne), seems to have turned against economic and social history of any kind. To my mind, this is a pity, since I believe it is possible to reconcile the different approaches. Politics and ideas obviously exist independently of economic and social evolutions. Parliamentary institutions and the government of laws were never merely the bourgeois institutions that Marxist intellectuals used to denounce before the fall of the Berlin Wall. Yet it is also clear that the ups and downs of prices and wages, incomes and fortunes, help to shape political perceptions and attitudes, and in return these representations engender political institutions, rules, and policies that ultimately shape social and economic change. It is possible, and even indispensable, to have an approach that is at once economic and political, social and cultural, and concerned with wages and wealth. The bipolar confrontations of the period 1917–1989 are now clearly behind us. The clash of communism and capitalism sterilized rather than stimulated research on capital and inequality by historians, economists, and even philosophers.² It is long since time to move beyond these old controversies and the historical research they engendered, which to my mind still bears their stamp.

As I noted in the introduction, there are also technical reasons for the premature death of serial history. The material difficulty of collecting and processing large volumes of data in those days probably explains why works in this genre (including *Le mouvement du profit en France au 19e siècle*) had little room for historical interpretation, which makes reading them rather arid. In particular, there is often very little analysis of the relation between observed

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economic changes and the political and social history of the period under study. Instead, one gets a meticulous description of the sources and raw data, information that is more naturally presented nowadays in spreadsheets and online databases.

I also think that the demise of serial history was connected with the fact that the research program petered out before it reached the twentieth century. In studying the eighteenth or nineteenth centuries it is possible to think that the evolution of prices and wages, or incomes and wealth, obeys an autonomous economic logic having little or nothing to do with the logic of politics or culture. When one studies the twentieth century, however, such an illusion falls apart immediately. A quick glance at the curves describing income and wealth inequality or the capital/income ratio is enough to show that politics is ubiquitous and that economic and political changes are inextricably intertwined and must be studied together. This forces one to study the state, taxes, and debt in concrete ways and to abandon simplistic and abstract notions of the economic infrastructure and political superstructure.

To be sure, the principle of specialization is sound and surely makes it legitimate for some scholars to do research that does not depend on statistical series. There are a thousand and one ways to do social science, and accumulating data is not always indispensable or even (I concede) especially imaginative. Yet it seems to me that all social scientists, all journalists and commentators, all activists in the unions and in politics of whatever stripe, and especially all citizens should take a serious interest in money, its measurement, the facts surrounding it, and its history. Those who have a lot of it never fail to defend their interests. Refusing to deal with numbers rarely serves the interests of the least well-off.

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Notes

In order to avoid burdening the text and footnotes with technical matters, precise details concerning historical sources, bibliographic references, statistical methods, and mathematical models have been included in a technical appendix, which can be accessed on the Internet at <http://piketty.pse.ens.fr/capital21c>.

In particular, the online technical appendix contains the data from which the graphs in the text were constructed, along with detailed descriptions of the relevant sources and methods. The bibliographic references and endnotes in the text have been pared down as much as possible, with more detailed references relegated to this appendix. It also contains a number of supplementary tables and figures, some of which are referred to in the notes (e.g., “see Supplementary Figure S1.1,” in Chapter 1, note 21). The online technical appendix and Internet site were designed as a complement to the book, which can thus be read on several levels.

Interested readers will also find online all relevant data files (mainly in Excel or Stata format), programs, mathematical formulas and equations, references to primary sources, and links to more technical papers on which this book draws.

My goal in writing was to make this book accessible to people without any special technical training, while the book together with the technical appendix should satisfy the demands of specialists in the field. This procedure will also allow me to post revised online versions and updates of the tables, graphs, and technical apparatus. I welcome input from readers of the book or website, who can send comments and criticisms to piketty@ens.fr.

Introduction

1. The English economist Thomas Malthus (1766–1834) is considered to be one of the most influential members of the “classical” school, along with Adam Smith (1723–1790) and David Ricardo (1772–1823).
2. There is of course a more optimistic school of liberals: Adam Smith seems to belong to it, and in fact he never really considered the possibility that the distribution of wealth might grow more unequal over the long run. The same is true of Jean-Baptiste Say (1767–1832), who also believed in natural harmony.
3. The other possibility is to increase supply of the scarce good, for example by finding new oil deposits (or new sources of energy, if possible cleaner than oil), or by moving toward a more dense urban environment (by constructing high-rise housing, for example), which raises other difficulties. In any case, this, too, can take decades to accomplish.
4. Friedrich Engels (1820–1895), who had direct experience of his subject, would become the friend and collaborator of the German philosopher and economist Karl

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Marx (1818–1883). He settled in Manchester in 1842, where he managed a factory owned by his father.

5. The historian Robert Allen recently proposed to call this long period of wage stagnation “Engels’ pause.” See Allen, “Engels’ Pause: A Pessimist’s Guide to the British Industrial Revolution,” Oxford University Department of Economics Working Papers 315 (2007). See also “Engels’ Pause: Technical Change, Capital Accumulation, and Inequality in the British Industrial Revolution,” in *Explorations in Economic History* 46, no. 4 (October 2009): 418–35.
6. The opening passage continues: “All the powers of old Europe have entered into a holy alliance to exorcise this specter: Pope and Tsar, Metternich and Guizot, French Radicals and German police-spies.” No doubt Marx’s literary talent partially accounts for his immense influence.
7. In 1847 Marx published *The Misery of Philosophy*, in which he mocked Proudhon’s *Philosophy of Misery*, which was published a few years earlier.
8. In Chapter 6 I return to the theme of Marx’s use of statistics. To summarize: he occasionally sought to make use of the best available statistics of the day (which were better than the statistics available to Malthus and Ricardo but still quite rudimentary), but he usually did so in a rather impressionistic way and without always establishing a clear connection to his theoretical argument.
9. Simon Kuznets, “Economic Growth and Income Inequality,” *American Economic Review* 45, no. 1 (1955): 1–28.
10. Robert Solow, “A Contribution to the Theory of Economic Growth,” *Quarterly Journal of Economics* 70, no. 1 (February 1956): 65–94.
11. See Simon Kuznets, *Shares of Upper Income Groups in Income and Savings* (Cambridge, MA: National Bureau of Economic Research, 1953). Kuznets was an American economist, born in Ukraine in 1901, who settled in the United States in 1922 and became a professor at Harvard after studying at Columbia University. He died in 1985. He was the first person to study the national accounts of the United States and the first to publish historical data on inequality.
12. Because it is often the case that only a portion of the population is required to file income tax returns, we also need national accounts in order to measure total income.
13. Put differently, the middle and working classes, defined as the poorest 90 percent of the US population, saw their share of national income increase from 50–55 percent in the 1910s and 1920s to 65–70 percent in the late 1940s.
14. See Kuznets, *Shares of Upper Income Groups*, 12–18. The Kuznets curve is sometimes referred to as “the inverted-U curve.” Specifically, Kuznets suggests that growing numbers of workers move from the poor agricultural sector into the rich industrial sector. At first, only a minority benefits from the wealth of the industrial sector, hence inequality increases. But eventually everyone benefits, so inequality decreases. It should be obvious that this highly stylized mechanism can be generalized. For example, labor can be transferred between industrial sectors or between jobs that are more or less well paid.

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15. It is interesting to note that Kuznets had no data to demonstrate the increase of inequality in the nineteenth century, but it seemed obvious to him (as to most observers) that such an increase had occurred.
16. As Kuznets himself put it: “This is perhaps 5 percent empirical information and 95 percent speculation, some of it possibly tainted by wishful thinking.” See Kuznets, *Shares of Upper Income Groups*, 24–26.
17. “The future prospect of underdeveloped countries within the orbit of the free world” (28).
18. In these representative-agent models, which have become ubiquitous in economic teaching and research since the 1960s, one assumes from the outset that each agent receives the same wage, is endowed with the same wealth, and enjoys the same sources of income, so that growth proportionately benefits all social groups by definition. Such a simplification of reality may be justified for the study of certain very specific problems but clearly limits the set of economic questions one can ask.
19. Household income and budget studies by national statistical agencies rarely date back before 1970 and tend to seriously underestimate higher incomes, which is problematic because the upper income decile often owns as much as half the national wealth. Tax records, for all their limitations, tell us more about high incomes and enable us to look back a century in time.
20. See Thomas Piketty, *Les hauts revenus en France au 20e siècle: Inégalités et redistributions 1901–1998* (Paris: Grasset, 2001). For a summary, see “Income Inequality in France, 1901–1998,” *Journal of Political Economy* 111, no. 5 (2003): 1004–42.
21. See Anthony Atkinson and Thomas Piketty, *Top Incomes over the Twentieth Century: A Contrast between Continental-European and English-Speaking Countries* (Oxford: Oxford University Press, 2007), and *Top Incomes: A Global Perspective* (Oxford: Oxford University Press, 2010).
22. See Thomas Piketty and Emmanuel Saez, “Income Inequality in the United States, 1913–1998,” *Quarterly Journal of Economics* 118, no. 1 (February 2003): 1–39.
23. A complete bibliography is available in the online technical appendix. For an overview, see also Anthony Atkinson, Thomas Piketty, and Emmanuel Saez, “Top Incomes in the Long-Run of History,” *Journal of Economic Literature* 49, no. 1 (March 2011): 3–71.
24. It is obviously impossible to give a detailed account of each country in this book, which offers a general overview. Interested readers can turn to the complete data series, which are available online at the WTID website (<http://topincomes.parisschoolofeconomics.eu>) as well as in the more technical books and articles cited above. Many texts and documents are also available in the online technical appendix (<http://piketty.pse.ens.fr/capital21c>).
25. The WTID is currently being transformed into the World Wealth and Income Database (WWID), which will integrate the three subtypes of complementary data. In this book I will present an overview of the information that is currently available.

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26. One can also use annual wealth tax returns in countries where such a tax is imposed in living individuals, but over the long run estate tax data are easier to come by.
27. See the following pioneering works: R.J. Lampman, *The Share of Top Wealth-Holders in National Wealth, 1922–1956* (Princeton: Princeton University Press, 1962); Anthony Atkinson and A.J. Harrison, *Distribution of Personal Wealth in Britain, 1923–1972* (Cambridge: Cambridge University Press, 1978).
28. See Thomas Piketty, Gilles Postel-Vinay, and Jean-Laurent Rosenthal, “Wealth Concentration in a Developing Economy: Paris and France, 1807–1994,” *American Economic Review* 96, no. 1 (March 2006): 236–56.
29. See Jesper Roine and Daniel Waldenström, “Wealth Concentration over the Path of Development: Sweden, 1873–2006,” *Scandinavian Journal of Economics* 111, no. 1 (March 2009): 151–87.
30. See Thomas Piketty, “On the Long-Run Evolution of Inheritance: France 1820–2050,” École d’économie de Paris, PSE Working Papers (2010). Summary version published in *Quarterly Journal of Economics* 126, no. 3 (2011): 1071–1131.
31. See Thomas Piketty and Gabriel Zucman, “Capital Is Back: Wealth-Income Ratios in Rich Countries, 1700–2010” (Paris: École d’économie de Paris, 2013).
32. See esp. Raymond Goldsmith, *Comparative National Balance Sheets: A Study of Twenty Countries, 1688–1978* (Chicago: University of Chicago Press, 1985). More complete references may be found in the online technical appendix.
33. See A.H. Jones, *American Colonial Wealth: Documents and Methods* (New York: Arno Press, 1977), and Adeline Daumard, *Les fortunes françaises au 19e siècle: Enquête sur la répartition et la composition des capitaux privés à Paris, Lyon, Lille, Bordeaux et Toulouse d’après l’enregistrement des déclarations de successions*, (Paris: Mouton, 1973).
34. See in particular François Simiand, *Le salaire, l’évolution sociale et la monnaie* (Paris: Alcan, 1932); Ernest Labrousse, *Esquisse du mouvement des prix et des revenus en France au 18e siècle* (Paris: Librairie Dalloz, 1933); Jean Bouvier, François Furet, and M. Gilet, *Le mouvement du profit en France au 19e siècle: Matériaux et études* (Paris: Mouton, 1965).
35. There are also intrinsically intellectual reasons for the decline of economic and social history based on the evolution of prices, incomes, and fortunes (sometimes referred to as “serial history”). In my view, this decline is unfortunate as well as reversible. I will come back to this point.
36. This destabilizing mechanism (the richer one is, the wealthier one gets) worried Kuznets a great deal, and this worry accounts for the title of his 1953 book *Shares of Upper Income Groups in Income and Savings*. But he lacked the historical distance to analyze it fully. This force for divergence was also central to James Meade’s classic *Efficiency, Equality, and the Ownership of Property* (London: Allen and Unwin, 1964), and to Atkinson and Harrison, *Distribution of Personal Wealth in Britain*, which in a way was the continuation of Meade’s work. Our work follows in the footsteps of these authors.

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1. Income and Output

1. “South African Police Open Fire on Striking Miners,” *New York Times*, August 17, 2012.
2. See the company’s official communiqué, “Lonmin Seeks Sustainable Peace at Marikana,” August 25, 2012, www.lonmin.com. According to this document, the base wage of miners before the strike was 5,405 rand per month, and the raise granted was 750 rand per month (1 South African rand is roughly equal to 0.1 euro). These figures seem consistent with those reported by the strikers and published in the press.
3. The “factorial” distribution is sometimes referred to as “functional” or “macroeconomic,” and the “individual” distribution is sometimes called “personal” or “microeconomic.” In reality, both types of distribution depend on both microeconomic mechanisms (which must be analyzed at the level of the firm or individual agents) and macroeconomic mechanisms (which can be understood only at the level of the national or global economy).
4. One million euros per year (equivalent to the wages of 200 miners), according to the strikers. Unfortunately, no information about this is available on the company’s website.
5. Roughly 65–70 percent for wages and other income from labor and 30–35 percent for profits, rents, and other income from capital.
6. About 65–70 percent for wages and other income from labor and 30–35 percent for profits, rents, and other income from capital.
7. National income is also called “net national product” (as opposed to “gross national product” (GNP), which includes the depreciation of capital). I will use the expression “national income,” which is simpler and more intuitive. Net income from abroad is defined as the difference between income received from abroad and income paid out to foreigners. These opposite flows consist primarily of income from capital but also include income from labor and unilateral transfers (such as remittances by immigrant workers to their home countries). See the online appendix for details.
8. In English one speaks of “national wealth” or “national capital.” In the eighteenth and nineteenth centuries, French authors spoke of *fortune nationale* and English authors of “national estate” (with a distinction in English between “real estate” and other property referred to as “personal estate”).
9. I use essentially the same definitions and the same categories of assets and liabilities as the current international standards for national accounts, with slight differences that are discussed in the online appendix.
10. Detailed figures for each country can be consulted in the tables available in the online appendix.
11. In practice, the median income (that is, the income level below which 50 percent of the population sits) is generally on the order of 20–30 percent less than average income. This is because the upper tail of the income distribution is much more

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drawn out than the lower tail and the middle, which raises the average (but not the median). Note, too, that “per capita national income” refers to average income before taxes and transfers. In practice, citizens of the rich countries have chosen to pay one-third to one-half of their national income in taxes and other charges in order to pay for public services, infrastructure, social protection, a substantial share of expenditures for health and education, etc. The issue of taxes and public expenditures is taken up primarily in Part Four.

12. Cash holdings (including in financial assets) accounted for only a minuscule part of total wealth, a few hundred euros per capita, or a few thousand if one includes gold, silver, and other valuable objects, or about 1–2 percent of total wealth. See the online technical appendix. Moreover, public assets are today approximately equal to public debts, so it is not absurd to say that households can include them in their financial assets.
13. The formula $\alpha = r \times \beta$ is read as “ α equals r times β .” Furthermore, “ $\beta = 600\%$ ” is the same as “ $\beta = 6$,” and “ $\alpha = 30\%$ ” is the same as “ $\alpha = 0.30$ ” and “ $r = 5\%$ ” is the same as “ $r = 0.05$.”
14. I prefer “rate of return on capital” to “rate of profit” in part because profit is only one of the legal forms that income from capital may take and in part because the expression “rate of profit” has often been used ambiguously, sometimes referring to the rate of return and other times (mistakenly) to the share of profits in income or output (that is, to denote what I am calling α rather than r , which is quite different). Sometimes the expression “marginal rate” is used to denote the share of profits α .
15. Interest is a very special form of the income from capital, much less representative than profits, rents, and dividends (which account for much larger sums than interest, given the typical composition of capital). The “rate of interest” (which, moreover, varies widely depending on the identity of the borrower) is therefore not representative of the average rate of return on capital and is often much lower. This idea will prove useful when it comes to analyzing the public debt.
16. The annual output to which I refer here corresponds to what is sometimes called the firm’s “value added,” that is, the difference between what the firm earns by selling goods and services (“gross revenue”) and what it pays other firms for goods and services (“intermediate consumption”). Value added measures the firm’s contribution to the domestic product. By definition, value added also measures the sum available to the firm to pay the labor and capital used in production. I refer here to value added net of capital depreciation (that is, after deducting the cost of wear and tear on capital and infrastructure) and profits net of depreciation.
17. See esp. Robert Giffen, *The Growth of Capital* (London: George Bell and Sons, 1889). For more detailed bibliographic data, see the online appendix.
18. The advantage of the ideas of national wealth and income is that they give a more balanced view of a country’s enrichment than the idea of GDP, which in some respects is too “productivist.” For instance, if a natural disaster destroys a great deal of wealth, the depreciation of capital will reduce national income, but GDP will be increased by reconstruction efforts.

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19. For a history of official systems of national accounting since World War II, written by one of the principal architects of the new system adopted by the United Nations in 1993 (the so-called System of National Accounts [SNA] 1993, which was the first to propose consistent definitions for capital accounts), see André Vanoli, *Une histoire de la comptabilité nationale* (Paris: La Découverte, 2002). See also the instructive comments of Richard Stone, “Nobel Memorial Lecture, 1984: The Accounts of Society,” *Journal of Applied Econometrics* 1, no. 1 (January 1986): 5–28. Stone was one of the pioneers of British and UN accounts in the postwar period. See also François Fourquet, *Les comptes de la puissance—Histoire de la comptabilité nationale et du plan* (Paris: Recherches, 1980), an anthology of contributions by individuals involved in constructing French national accounts in the period 1945–1975.
20. Angus Maddison (1926–2010) was a British economist who specialized in reconstituting national accounts at the global level over a very long run. Note that Maddison’s historical series are concerned solely with the flow of output (GDP, population, and GDP per capita) and say nothing about national income, the capital-labor split, or the stock of capital. On the evolution of the global distribution of output and income, see also the pioneering work of François Bourguignon and Branko Milanovic. See the online technical appendix.
21. The series presented here go back only as far as 1700, but Maddison’s estimates go back all the way to antiquity. His results suggest that Europe began to move ahead of the rest of the world as early as 1500. By contrast, around the year 1000, Asia and Africa (and especially the Arab world) enjoyed a slight advantage. See Supplemental Figures S1.1, S1.2, and S1.3 (available online).
22. To simplify the exposition, I include in the European Union smaller European countries such as Switzerland, Norway, and Serbia, which are surrounded by the European Union but not yet members (the population of the European Union in the narrow sense was 510 million in 2012, not 540 million). Similarly, Belarus and Moldavia are included in the Russia-Ukraine bloc. Turkey, the Caucasus, and Central Asia are included in Asia. Detailed figures for each country are available online.
23. See Supplemental Table S1.1 (available online).
24. The same can be said of Australia and New Zealand (with a population of barely 30 million, or less than 0.5 percent of the world’s population, with a per capita GDP of around 30,000 euros per year). For simplicity’s sake, I include these two countries in Asia. See Supplemental Table S1.1 (available online).
25. If the current exchange rate of \$1.30 per euro to convert American GDP had been used, the United States would have appeared to be 10 percent poorer, and GDP per capital would have declined from 40,000 to about 35,000 euros (which would in fact be a better measure of the purchasing power of an American tourist in Europe). See Supplemental Table S1.1. The official ICP estimates are made by a consortium of international organizations, including the World Bank, Eurostat, and others. Each country is treated separately. There are variations within the Eurozone,

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- and the euro/dollar parity of \$1.20 is an average. See the online technical appendix.
26. The secular decline of US dollar purchasing power vis-à-vis the euro since 1990 simply reflects the fact that inflation in the United States was slightly higher (0.8 percent, or nearly 20 percent over 20 years). The current exchange rates shown in Figure 1.4 are annual averages and thus obscure the enormous short-term volatility.
 27. See *Global Purchasing Power Parities and Real Expenditures—2005 International Comparison Programme* (Washington, DC: World Bank, 2008), table 2, pp. 38–47. Note that in these official accounts, free or reduced-price public services are measured in terms of their production cost (for example, teachers' wages in education), which is ultimately paid by taxpayers. This is the result of a statistical protocol that is ultimately paid by the taxpayer. It is an imperfect statistical contract, albeit still more satisfactory than most. A statistical convention that refused to take any of these national statistics into account would be worse, resulting in highly distorted international comparisons.
 28. This is the usual expectation (in the so-called Balassa-Samuelson model), which seems to explain fairly well why the purchasing-power parity adjustment is greater than 1 for poor countries vis-à-vis rich countries. Within rich countries, however, things are not so clear: the richest country in the world (the United States) had a purchasing-power parity correction greater than 1 until 1970, but it was less than 1 in the 1980s. Apart from measurement error, one possible explanation would be the high degree of wage inequality observed in the United States in recent years, which might lead to lower prices in the unskilled, labor-intensive, nontradable service sector (just as in the poor countries). See the online technical appendix.
 29. See Supplementary Table S1.2 (available online).
 30. I have used official estimates for the recent period, but it is entirely possible that the next ICP survey will result in a reevaluation of Chinese GDP. On the Maddison/ICP controversy, see the online technical appendix.
 31. See Supplemental Table S1.2 (available online). The European Union's share would rise from 21 to 25 percent, that of the US–Canada bloc from 20 to 24 percent, and that of Japan from 5 to 8 percent.
 32. This of course does not mean that each continent is hermetically sealed off from the others: these net flows hide large cross-investments between continents.
 33. This 5 percent figure for the African continent appears to have remained fairly stable during the period 1970–2012. It is interesting to note that the outflow of income from capital was on the order of three times greater than the inflow of international aid (the measurement of which is open to debate, moreover). For further details on all these estimates, see the online technical appendix.
 34. In other words, the Asian and African share of world output in 1913 was less than 30 percent, and their share of world income was closer to 25 percent. See the online technical appendix.
 35. It has been well known since the 1950s that accumulation of physical capital explains only a small part of long-term productivity growth; the essential thing is

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the accumulation of human capital and new knowledge. See in particular Robert M. Solow, “A Contribution to the Theory of Economic Growth,” *Quarterly Journal of Economics* 70, no. 1 (February 1956): 65–94. The recent articles of Charles I. Jones and Paul M. Romer, “The New Kaldor Facts: Ideas, Institutions, Population and Human Capital,” *American Economic Journal: Macroeconomics* 2, no. 1 (January 2010): 224–45, and Robert J. Gordon, “Is U.S. Economic Growth Over? Faltering Innovation Confronts the Six Headwinds,” NBER Working Paper 18315 (August 2012), are good points of entry into the voluminous literature on the determinants of long-run growth.

36. According to one recent study, the static gains from the opening of India and China to global commerce amount to just 0.4 percent of global GDP, 3.5 percent of GDP for China, and 1.6 percent for India. In view of the enormous redistributive effects between sectors and countries (with very large numbers of losers in all countries), it seems difficult to justify trade openness (to which these countries nevertheless seem attached) solely on the basis of such gains. See the online technical appendix.

2. Growth: Illusions and Realities

1. See Supplemental Table S2.1, available online, for detailed results by subperiod.
2. The emblematic example is the Black Plague of 1347, which ostensibly claimed more than a third of the European population, thus negating several centuries of slow growth.
3. If we take aging into account, the growth rate of the global adult population was even higher: 1.9 percent in the period 1990–2012 (during which the proportion of adults in the population rose from 57 percent to 65 percent, reaching close to 80 percent in Europe and Japan and 75 percent in North America in 2012). See the online technical appendix.
4. If the fertility rate is 1.8 (surviving) children per woman, or 0.9 per adult, than the population will automatically decrease by 10 percent every generation, or roughly –0.3 percent per year. Conversely, a fertility rate of 2.2 children per woman, or 1.1 per adult, yields a growth rate of 10 percent per generation (or +0.3 percent per year). With 1.5 children per woman, the growth rate is –1.0 percent per year, and with 2.5 children per women, it is +0.7 percent.
5. It is impossible to do justice here to the large number of works of history, sociology, and anthropology that have tried to analyze, by country and region, the evolution and variations of demographic behavior (which, broadly speaking, encompasses questions of fertility, marriage, family structure, and so on). To take just one example, consider the work of Emmanuel Todd and Hervé Le Bras in mapping family systems in France, Europe, and around the world, from *L’Invention de la France* (Paris: Livre de Poche, 1981; reprint, Paris: Gallimard, 2012) to *L’origine des systèmes familiaux* (Paris: Gallimard, 2011). Or, to take a totally different perspective, see the work of Gosta Esping Andersen on the different types of welfare

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- state and the growing importance of policies designed to make work life and family life compatible: for example, *The Three Worlds of Welfare Capitalism* (Princeton: Princeton University Press, 1990).
6. See the online technical appendix for detailed series by country.
 7. The global population growth rate from 2070 to 2100 will be 0.1 percent according to the central scenario, –1.0 percent according to the low scenario, and +1.2 percent according to the high scenario. See the online technical appendix.
 8. See Pierre Rosanvallon, *The Society of Equals*, trans. Arthur Goldhammer (Cambridge, MA: Harvard University Press, 2013), 93.
 9. In 2012, the average per capita GDP in Sub-Saharan Africa was about 2,000 euros, implying an average monthly income of 150 euros per person (cf. Chapter 1, Table 1.1). But the poorest countries (such as Congo-Kinshasa, Niger, Chad, and Ethiopia) stand at one-third to one-half that level, while the richest (such as South Africa) are two to three times better off (and close to North African levels). See the online technical appendix.
 10. Maddison's estimates (which are fragile for this period) suggest that in 1700, North America and Japan were closer to the global average than to Western Europe, so that overall growth in average income in the period 1700–2012 would be closer to thirty times than to twenty.
 11. Over the long run, the average number of hours worked per capita has been cut by approximately one-half (with significant variation between countries), so that productivity growth has been roughly twice that of per capita output growth.
 12. See Supplemental Table S2.2, available online.
 13. Interested readers will find in the online technical appendix historical series of average income for many countries since the turn of the eighteenth century, expressed in today's currency. For detailed examples of the price of foodstuffs, manufactured goods, and services in nineteenth- and twentieth-century France (taken from various historical sources including official indices and compilations of prices published by Jean Fourastié), along with analysis of the corresponding increases in purchasing power, see Thomas Piketty, *Les Hauts revenus en France au 20e siècle* (Paris: Grasset, 2001), 80–92.
 14. Of course, everything depended on where carrots were purchased. I am speaking here of the average price.
 15. See Piketty, *Les Hauts revenus en France*, 83–85.
 16. *Ibid.*, 86–87.
 17. For a historical analysis of the constitution of these various strata of services from the late nineteenth century to the late twentieth, starting with the examples of France and the United States, see Thomas Piketty, “Les Créations d’emploi en France et aux Etats-Unis: Services de proximité contre petits boulots?” *Les Notes de la Fondation Saint-Simon* 93, 1997. See also “L’Emploi dans les services en France et aux Etats-Unis: Une analyse structurelle sur longue période,” *Economie et statistique* 318, no. 1 (1998): 73–99. Note that in government statistics the pharmaceutical industry is counted in industry and not in health services, just as the

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- automobile and aircraft industries are counted in industry and not transport services, etc. It would probably be more perspicuous to group activities in terms of their ultimate purpose (health, transport, housing, etc.) and give up on the distinction agriculture/industry/services.
18. Only the depreciation of capital (replacement of used buildings and equipment) is taken into account in calculating costs of production. But the remuneration of public capital, net of depreciation, is conventionally set at zero.
 19. In Chapter 6 I take another look at the magnitude of the bias thus introduced into international comparisons.
 20. Hervé Le Bras and Emmanuel Todd say much the same thing when they speak of the “Trente glorieuses culturelles” in describing the period 1980–2010 in France. This was a time of rapid educational expansion, in contrast to the “Trente glorieuses économiques” of 1950–1980. See *Le mystère français* (Paris: Editions du Seuil, 2013).
 21. To be sure, growth was close to zero in the period 2007–2012 because of the 2008–2009 recession. See Supplemental Table S2.2, available online, for detailed figures for Western Europe and North America (not very different from the figures indicated here for Europe and North America as a whole) and for each country separately.
 22. See Robert J. Gordon, *Is U.S. Economic Growth Over? Faltering Innovation Confronts the Six Headwinds*, NBER Working Paper 18315 (August 2012).
 23. I return to this question later. See esp. Part Four, Chapter 11.
 24. Note that global per capita output, estimated to have grown at a rate of 2.1 percent between 1990 and 2012, drops to 1.5 percent if we look at output growth per adult rather than per capita. This is a logical consequence of the fact that demographic growth rose from 1.3 to 1.9 percent per year during this period, which allows us to calculate both the total population and the adult population. This shows the importance of the demographic issue when it comes to breaking down global output growth (3.4 percent per year). See the online technical appendix.
 25. Only Sub-Saharan Africa and India continue to lag. See the online technical appendix.
 26. See Chapter 1, Figures 1.1–1.2.
 27. The law of 25 germinal, Year IV (April 14, 1796), confirmed the silver parity of the franc, and the law of 17 germinal, Year XI (April 7, 1803), set a double parity: the franc was equal to 4.5 grams of fine silver and 0.29 grams of gold (for a gold:silver ratio of 1/15.5). It was the law of 1803, promulgated a few years after the creation of the Banque de France in 1800, that give rise to the appellation “franc germinal.” See the online technical appendix.
 28. Under the gold standard observed from 1816 to 1914, a pound sterling was worth 7.3 grams of fine gold, or exactly 25.2 times the gold parity of the franc. Gold-silver bimetallism introduced several complications, about which I will say nothing here.
 29. Until 1971, the pound sterling was divided into 20 shillings, each of which was further divided into 12 pence (so that there were 240 pence in a pound). A guinea

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was worth 21 shillings, or 1.05 pounds. It was often used to quote prices for professional services and in fashionable stores. In France, the livre tournois was also divided into 20 deniers and 240 sous until the decimal reform of 1795. After that, the franc was divided into 100 centimes, sometimes called “sous” in the nineteenth century. In the eighteenth century, a louis d’or was a coin worth 20 livres tournois, or approximately 1 pound sterling. An écu was worth 3 livres tournois until 1795, after which it referred to a silver coin worth 5 francs from 1795 to 1878. To judge by the way novelists shifted from one unit to another, it would seem that contemporaries were perfectly aware of these subtleties.

30. The estimates referred to here concern national income per adult, which I believe is more significant than national income per capita. See the online technical appendix.
31. Average annual income in France ranged from 700 to 800 francs in the 1850s and from 1300 to 1400 francs in 1900–1910. See the online technical appendix.

3. *The Metamorphoses of Capital*

1. According to available estimates (especially King’s and Petty’s for Britain and Vauban’s and Boisguillebert’s for France), farm buildings and livestock accounted for nearly half of what I am classifying as “other domestic capital” in the eighteenth century. If we subtracted these items in order to concentrate on industry and services, then the increase in other domestic capital not associated with agriculture would be as large as the increase in housing capital, indeed slightly higher.
2. César Birotteau’s real estate speculation in the Madeleine quarter is a good example.
3. Think of Père Goriot’s pasta factories or César Birotteau’s perfume operation.
4. For further details, see the online technical appendix.
5. See the online technical appendix.
6. Detailed annual series of trade and payment balances for Britain and France are available in the online technical appendix.
7. Since 1950, the net foreign holdings of both countries have nearly always ranged between –10 and +10 percent of national income, which is one-tenth to one-twentieth of the level attained around the turn of the twentieth century. The difficulty of measuring net foreign holdings today does not undermine this finding.
8. More precisely, for an average income of 30,000 euros in 1700, average wealth would have been on the order of 210,000 euros (seven years of income rather than six), 150,000 of which would have been in land (roughly five years of income if one includes farm buildings and livestock), 30,000 in housing, and 30,000 in other domestic assets.
9. Again, for an average income of 30,000 euros, average wealth in 1910 would have been closer to 210,000 euros (seven years of national income), with other domestic assets closer to 90,000 (three years income) than 60,000 (two years). All the fig-

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- ures given here are deliberately simplified and rounded off. See the online technical appendix for further details.
10. More precisely, Britain's public assets amount to 93 percent of national income, and its public debts amount to 92 percent, for a net public wealth of +1 percent of national income. In France, public assets amount to 145 percent of national income and debts to 114 percent, for a net public wealth of +31 percent. See the online technical appendix for detailed annual series for both countries.
 11. See François Crouzet, *La Grande inflation: La monnaie en France de Louis XVI à Napoléon* (Paris: Fayard, 1993).
 12. In the period 1815–1914, Britain's primary budget surplus varied between 2 and 3 percent of GDP, and this went to pay interest on government debt of roughly the same amount. The total budget for education in this period was less than 2 percent of GDP. For detailed annual series of primary and secondary public deficits, see the online technical appendix.
 13. These two series of transfers explain most of the increase in French public debt in the nineteenth century. On the amounts and sources, see the online technical appendix.
 14. Between 1880 and 1914, France paid more interest on its debt than Britain did. For detailed annual series of government deficits in both countries and on the evolution of the rate of return on public debts, see the online technical appendix.
 15. Ricardo's discussion of this issue in *Principles of Political Economy and Taxation* (London: George Bell and Sons, 1817) is not without ambiguity, however. On this point, see Gregory Clark's interesting historical analysis, "Debt, Deficits, and Crowding Out: England, 1716–1840," *European Review of Economic History* 5, no. 3 (December 2001): 403–36.
 16. See Robert Barro, "Are Government Bonds Net Wealth?" *Journal of Political Economy* 82, no. 6 (1974): 1095–1117, and "Government Spending, Interest Rates, Prices, and Budget Deficits in the United Kingdom, 1701–1918," *Journal of Monetary Economics* 20, no. 2 (1987): 221–48.
 17. Paul Samuelson, *Economics*, 8th ed. (New York: McGraw-Hill, 1970), 831.
 18. See Claire Andrieu, L. Le Van, and Antoine Prost, *Les Nationalisations de la Libération: De l'utopie au compromis* (Paris: FNSP, 1987), and Thomas Piketty, *Les hauts revenus en France au 20e siècle* (Paris: Grasset, 2001), 137–138.
 19. It is instructive to reread British estimates of national capital at various points during the twentieth century, as the form and magnitude of public assets and liabilities changed utterly. See in particular H. Champion, *Public and Private Property in Great Britain* (Oxford: Oxford University Press, 1939), and J. Revell, *The Wealth of the Nation: The National Balance Sheet of the United Kingdom, 1957–1961* (Cambridge: Cambridge University Press, 1967). The question barely arose in Giffen's time, since private capital so clearly outweighed public capital. We find the same evolution in France, for example in the 1956 work published by François Divisia, Jean Dupin, and René Roy and quite aptly entitled *A la recherche du franc perdu* (Paris: Société d'édition de revues et de publications, 1954), whose third

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volume is titled *La fortune de la France* and attempts, not without difficulty, to update Clément Colson's estimates for the Belle Époque.

4. *From Old Europe to the New World*

1. In order to concentrate on long-run evolutions, the figures accompanying this chapter indicate values by decade only and thus ignore extremes that lasted for only a few years. For complete annual series, see the online technical appendix.
2. The average inflation figure of 17 percent for the period 1913–1950 omits the year 1923, when prices increased by a factor of 100 million over the course of the year.
3. Virtually equal to General Motors, Toyota, and Renault-Nissan, with sales of around 8 million vehicles each in 2011. The French government still holds about 15 percent of the capital of Renault (the third leading European manufacturer after Volkswagen and Peugeot).
4. Given the limitations of the available sources, it is also possible that this gap can be explained in part by various statistical biases. See the online technical appendix.
5. See, for example, Michel Albert, *Capitalisme contre capitalisme* (Paris: Le Seuil, 1991).
6. See, for example, Guillaume Duval, *Made in Germany* (Paris: Le Seuil, 2013).
7. See the online technical appendix.
8. The difference from Ricardo's day was that wealthy Britons in the 1800s and 1810s were prosperous enough to generate the additional private saving needed to absorb public deficits without affecting national capital. By contrast, the European deficits of 1914–1945 occurred in a context where private wealth and saving had already been subjected to repeated negative shocks, so that public indebtedness aggravated the decline of national capital.
9. See the online technical appendix.
10. See Alexis de Tocqueville, *Democracy in America*, trans. Arthur Goldhammer (New York: Library of America, 2004), II.2.19, p. 646, and II.3.6, p. 679.
11. On Figures 3.1–2, 4.1, 4.6, and 4.9, positive positions relative to the rest of the world are unshaded (indicating periods of net positive foreign capital) and negative positions are shaded (periods of net positive foreign debt). The complete series used to establish all these figures are available in the online technical appendix.
12. See Supplemental Figures S4.1–2, available online.
13. On reactions to European investments in the United States during the nineteenth century, see, for example, Mira Wilkins, *The History of Foreign Investment in the United States to 1914* (Cambridge, MA: Harvard University Press, 1989), chap. 16.
14. Only a few tens of thousands of slaves were held in the North. See the online technical appendix.
15. If each person is treated as an individual subject, then slavery (which can be seen as an extreme form of debt between individuals) does not increase national

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wealth, like any other private or public debt (debts are liabilities for some individuals and assets for others, hence they cancel out at the global level).

16. The number of slaves in French colonies emancipated in 1848 has been estimated at 250,000 (or less than 10 percent of the number of slaves in the United States). As in the United States, however, forms of legal inequality continued well after formal emancipation: in Réunion, for example, after 1848 former slaves could be arrested and imprisoned as indigents unless they could produce a labor contract as a servant or worker on a plantation. Compared with the previous legal regime, under which fugitive slaves were hunted down and returned to their masters if caught, the difference was real, but it represented a shift in policy rather than a complete break with the previous regime.
17. See the online technical appendix.
18. For example, if national income consists of 70 percent income from labor and 30 percent income from capital and one capitalizes these incomes at 5 percent, then the total value of the stock of human capital will equal fourteen years of national income, that of the stock of nonhuman capital will equal six years of national income, and the whole will by construction equal twenty years. With a 60–40 percent split of national income, which is closer to what we observe in the eighteenth century (at least in Europe), we obtain twelve years and eight years, respectively, again for a total of twenty years.

5. *The Capital/Income Ratio over the Long Run*

1. The European capital/income ratio indicated in Figures 5.1 and 5.2 was estimated by calculating the average of the available series for the four largest European economies (Germany, France, Britain, and Italy), weighted by the national income of each country. Together, these four countries represent more than three-quarters of Western European GDP and nearly two-thirds of European GDP. Including other countries (especially Spain) would yield an even steeper rise in the capital/income ratio over the last few decades. See the online technical appendix.
2. The formula $\beta = s/g$ is read as “ β equals s divided by g .” Recall, too, that “ $\beta = 600\%$ ” is equivalent to “ $\beta = 6$,” just as “ $s = 12\%$ ” is equivalent to “ $s = 0.12$ ” and “ $g = 2\%$ ” is equivalent to “ $g = 0.02$.” The savings rate represents truly new savings—hence net of depreciation of capital—divided by national income. I will come back to this point.
3. Sometimes g is used to denote the growth rate of national income per capita and n the population growth rate, in which case the formula would be written $\beta = s/(g + n)$. To keep the notation simple, I have chosen to use g for the overall growth rate of the economy, so that my formula is $\beta = s/g$.
4. Twelve percent of income gives 12 divided by 6 or 2 percent of capital. More generally, if the savings rate is s and the capital/income ratio is β , then the capital stock grows at a rate equal to s/β .

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5. The simple mathematical equation describing the dynamics of the capital/income ratio β and its convergence toward $\beta = s/g$ is given in the online technical appendix.
6. From 2.2 years in Germany to 3.4 years in the United States in 1970. See Supplemental Table S5.1, available online, for the complete series.
7. From 4.1 years in Germany and the United States to 6.1 years in Japan and 6.8 years in Italy in 2010. The values indicated for each year are annual averages. (For example, the value indicated for 2010 is the average of the wealth estimates on January 1, 2010, and January 1, 2011.) The first available estimates for 2012–2013 are not very different. See the online technical appendix.
8. In particular, it would suffice to change from one price index to another (there are several of them, and none is perfect) to alter the relative rank of these various countries. See the online technical appendix.
9. See Supplemental Figure S5.1, available online.
10. More precisely: the series show that the private capital/national income ratio rose from 299 percent in 1970 to 601 percent in 2010, whereas the accumulated flows of savings would have predicted an increase from 299 to 616 percent. The error is therefore 15 percent of national income out of an increase on the order of 300 percent, or barely 5 percent: the flow of savings explains 95 percent of the increase in the private capital/national income ratio in Japan between 1970 and 2010. Detailed calculations for all countries are available in the online technical appendix.
11. When a firm buys its own shares, it enables its shareholders to realize capital gains, which will generally be taxed less heavily than if the firm had used the same sum of money to distribute dividends. It is important to realize that the same is true when a firm buys the stock of other firms, so that overall the business sector allows the individual sector to realize capital gains by purchasing financial instruments.
12. One can also write the law $\beta = s/g$ with s standing for the total rather than the net rate of saving. In that case the law becomes $\beta = s/(g + \delta)$ (where δ now stands for the rate of depreciation of capital expressed as a percentage of the capital stock). For example, if the raw savings rate is $s = 2.4\%$, and if the depreciation rate of the capital stock is $\delta = 2\%$, for a growth rate of $g = 2\%$, then we obtain a capital income ratio $\beta = s/(g + \delta) = 600\%$. See the online technical appendix.
13. With a growth of $g = 2\%$, it would take a net expenditure on durable goods equal to $s = 1\%$ of national income per year to accumulate a stock of durable goods equal to $\beta = s/g = 50\%$ of national income. Durable goods need to be replaced frequently, however, so the gross expenditure would be considerably higher. For example, if average replacement time is five years, one would need a gross expenditure on durable goods of 10 percent of national income per year simply to replace used goods, and 11 percent a year to generate a net expenditure of 1% and an equilibrium stock of 50% of national income (still assuming growth $g = 2\%$). See the online technical appendix.

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14. The total value of the world's gold stock has decreased over the long run (it was 2 to 3 percent of total private wealth in the nineteenth century but less than 0.5 percent at the end of the twentieth century). It tends to rise during periods of crisis, however, because gold serves as a refuge, so that it currently accounts for 1.5 percent of total private wealth, of which roughly one-fifth is held by central banks. These are impressive variations, yet they are minor compared with the overall value of the capital stock. See the online technical appendix.
15. Even though it does not make much difference, for the sake of consistency I have used the same conventions for the historical series discussed in Chapters 3 and 4 and for the series discussed here for the period 1970–2010: durable goods have been excluded from wealth, and valuables have been included in the category labeled “other domestic capital.”
16. In Part Four I return to the question of taxes, transfers, and redistributions effected by the government, and in particular to the question of their impact on inequality and on the accumulation and distribution of capital.
17. See the online technical appendix.
18. Net public investment is typically rather low (generally around 0.5–1 percent of national income, of which 1.5–2 percent goes to gross public investment and 0.5–1 percent to depreciation of public capital), so negative public saving is often fairly close to the government deficit. (There are exceptions, however: public investment is higher in Japan, which is the reason why public saving is slightly positive despite significant government deficits.) See the online technical appendix.
19. This possible undervaluation is linked to the small number of public asset transactions in this period. See the online technical appendix.
20. Between 1870 and 2010, the average rate of growth of national income was roughly 2–2.2 percent in Europe (of which 0.4–0.5 percent came from population growth) compared with 3.4 percent in the United States (of which 1.5 percent came from population growth). See the online technical appendix.
21. An unlisted firm whose shares are difficult to sell because of the small number of transactions, so that it takes a long time to find an interested buyer, may be valued 10 to 20 percent lower than a similar company listed on the stock exchange, for which it is always possible to find an interested buyer or seller on the same day.
22. The harmonized international norms used for national accounts—which I use here—prescribe that assets and liabilities must always be recorded at their market value as of the date of the balance sheet (that is, the value that could be obtained if the firm decided to liquidate its assets, estimated if need be by using recent transactions for similar goods). The private accounting norms that firms use when publishing their balance sheets are not exactly the same as the norms for national accounts and vary from country to country, raising multiple problems for financial and prudential regulation as well as for taxation. In Part Four I come back to the crucial issue of harmonization of accounting standards.

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23. See, for example, “Profil financier du CAC 40,” a report by the accounting firm Ricol Lasteyrie, June 26, 2012. The same extreme variation in Tobin’s Q is found in all countries and all stock markets.
24. See the online technical appendix.
25. Germany’s trade surplus attained 6 percent of GDP in the early 2010s, and this enabled the Germans to rapidly amass claims on the rest of the world. By comparison, the Chinese trade surplus is only 2 percent of GDP (both Germany and China have trade surpluses of 170–180 billion euros a year, but China’s GDP is three times that of Germany: 10 trillion euros versus 3 trillion). Note, too, that five years of German trade surpluses would be enough to buy all the real estate in Paris, and five more years would be enough to buy the CAC 40 (around 800–900 billion euros for each purchase). Germany’s very large trade surplus seems to be more a consequence of the vagaries of German competitiveness than of an explicit policy of accumulation. It is therefore possible that domestic demand will increase and the trade surplus will decrease in coming years. In the oil exporting countries, which are explicitly seeking to accumulate foreign assets, the trade surplus is more than 10 percent of GDP (in Saudi Arabia and Russia, for example) and even multiples of that in some of the smaller petroleum exporters. See Chapter 12 and the online technical appendix.
26. See Supplemental Figure S5.2, available online.
27. In the case of Spain, many people noticed the very rapid rise of real estate and stock market indices in the 2000s. Without a precise point of reference, however, it is very difficult to determine when valuations have truly climbed to excessive heights. The advantage of the capital/income ratio is that it provides a precise point of reference useful for making comparisons in time and space.
28. See Supplemental Figures S5.3–4, available online. It bears emphasizing, moreover, that the balances established by central banks and government statistical agencies concern only primary financial assets (notes, shares, bonds, and other securities) and not derivatives (which are like insurance contracts indexed to these primary assets or, perhaps better, like wagers, depending on how one sees the problem), which would bring the total to even higher levels (twenty to thirty years of national income, depending on the definitions one adopts). It is nevertheless important to realize that these quantities of financial assets and liabilities, which are higher today than ever in the past (in the nineteenth century and until World War I, the total amount of financial assets and liabilities did not exceed four to five years of national income) by definition have no impact on net wealth (any more than the amount of bets placed on a sporting event influences the level of national wealth). See the online technical appendix.
29. For example, the financial assets held in France by the rest of the world amounted to 310 percent of national income in 2010, and financial assets held by French residents in the rest of the world amounted to 300 percent of national income, for a negative net position of –10 percent. In the United States, a negative net position of –20 percent corresponds to financial assets on the order of 120 percent of na-

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- tional income held by the rest of the world in the United States and 100 percent of national income owned by US residents in other countries. See Supplemental Figures S5.5–11, available online, for detailed series by country.
30. In this regard, note that one key difference between the Japanese and Spanish bubbles is that Spain now has a net negative foreign asset position of roughly one year's worth of national income (which seriously complicates Spain's situation), whereas Japan has a net positive position of about the same size. See the online technical appendix.
 31. In particular, in view of the very large trade deficits the United States has been running, its net foreign asset position ought to be far more negative than it actually is. The gap is explained in part by the very high return on foreign assets (primarily stocks) owned by US citizens and the low return paid on US liabilities (especially US government bonds). On this subject, see the work of Pierre-Olivier Gourinchas and Hélène Rey cited in the online technical appendix. Conversely, Germany's net position should be higher than it is, and this discrepancy is explained by the low rates of return on Germany's investments abroad, which may partially account for Germany's current wariness. For a global decomposition of the accumulation of foreign assets by rich countries between 1970 and 2010, which distinguishes between the effects of trade balances and the effects of returns on the foreign asset portfolio, see the online technical appendix (esp. Supplemental Table S5.13, available online).
 32. For example, it is likely that a significant part of the US trade deficit simply corresponds to fictitious transfers to US firms located in tax havens, transfers that are subsequently repatriated in the form of profits realized abroad (which restores the balance of payments). Clearly, such accounting games can interfere with the analysis of the most basic economic phenomena.
 33. It is difficult to make comparisons with ancient societies, but the rare available estimates suggest that the value of land sometimes reached even higher levels: six years of national income in ancient Rome, according to R. Goldsmith, *Pre-modern Financial Systems: A Historical Comparative Study* (Cambridge: Cambridge University Press, 1987), 58. Estimates of the intergenerational mobility of wealth in small primitive societies suggest that the importance of transmissible wealth varied widely depending on the nature of economic activity (hunting, herding, farming, etc.). See Monique Borgerhoff Mulder et al., "Intergenerational Wealth Transmission and the Dynamics of Inequality in Small-Scale Societies," *Science* 326, no. 5953 (October 2009): 682–88.
 34. See the online technical appendix.
 35. See Chapter 12.

6. *The Capital-Labor Split in the Twenty-First Century*

1. Interest on the public debt, which is not part of national income (because it is a pure transfer) and which remunerates capital that is not included in national capital

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(because public debt is an asset for private bondholders and a liability for the government), is not included in Figures 6.14. If it were included, capital's share of income would be a little higher, generally on the order of one to two percentage points (and up to four to five percentage points in periods of unusually high public debt). For the complete series, see the online technical appendix.

2. One can either attribute to nonwage workers the same average labor income as wage workers, or one can attribute to the business capital used by nonwage workers the same average return as for other forms of capital. See the online technical appendix.
3. In the rich countries, the share of individually owned businesses in domestic output fell from 30–40 percent in the 1950s (and from perhaps 50 percent in the nineteenth and early twentieth centuries) to around 10 percent in the 1980s (reflecting mainly the decline in the share of agriculture) and then stabilized at around that level, at times rising to about 12–15 percent in response to changing fiscal advantages and disadvantages. See the online technical appendix.
4. The series depicted in Figures 6.1 and 6.2 are based on the historical work of Robert Allen for Britain and on my own work for France. All details on sources and methods are available in the online technical appendix.
5. See also Supplemental Figures S6.1 and S6.2, available online, on which I have indicated upper and lower bounds for capital's share of income in Britain and France.
6. See in particular Chapter 12.
7. The interest rate on the public debt of Britain and France in the eighteenth and nineteenth centuries was typically on the order of 4–5 percent. It sometimes went as low as 3 percent (for example, during the economic slowdown of the late nineteenth century) Conversely, it rose to 5–6 percent or even higher during periods of high political tension, when there was doubt about the credibility of the government budget, for example, during the decades prior to and during the French Revolution. See F. Velde and D. Weir, "The Financial Market and Government Debt Policy in France 1746–1793," *Journal of Economic History* 52, no. 1 (March 1992): 1–39. See also K. Béguin, *Financer la guerre au 17^e siècle: La dette publique et les rentiers de l'absolutisme* (Seysse: Champ Vallon, 2012). See online appendix.
8. The French "livret A" savings account paid a nominal interest of barely 2 percent in 2013, for a real return of close to zero.
9. See the online technical appendix. In most countries, checking account deposits earn interest (but this is forbidden in France).
10. For example, a nominal interest rate of 5 percent with an inflation rate of 10 percent corresponds to a real interest rate of –5 percent, whereas a nominal interest rate of 15 percent and an inflation rate of 5 percent corresponds to a real interest rate of +10 percent.
11. Real estate assets alone account for roughly half of total assets, and among financial assets, real assets generally account for more than half of the total and often more than three-quarters. See the online technical appendix.

12. As I explained in Chapter 5, however, this approach includes in the return of capital the structural capital gain due to capitalization of retained earnings as reflected in the stock price, which is an important component of the return on stocks over the long run.
13. In other words, an increase of inflation from 0 to 2 percent in a society where the return on capital is initially 4 percent is certainly not equivalent to a 50 percent tax on income from capital, for the simple reason that the price of real estate and stocks will begin to increase at 2 percent a year, so that only a small proportion of the assets owned by households—broadly speaking, cash deposits and some nominal assets—will pay the inflation tax. I will return to this question in Chapter 12.
14. See P. Hoffman, Gilles Postel-Vinay, and Jean-Laurent Rosenthal, *Priceless Markets: The Political Economy of Credit in Paris 1660–1870* (Chicago: University of Chicago Press, 2000).
15. In the extreme case of zero elasticity, the return on capital and therefore the capital share of income fall to zero if there is even a slight excess of capital.
16. In the extreme case of infinite elasticity, the return on capital does not change, so that the capital share of income increases in the same proportion as the capital/income ratio.
17. It can be shown that the Cobb-Douglas production function takes the mathematical form $Y = F(K, L) = K^\alpha L^{1-\alpha}$, where Y is output, K is capital, and L is labor. There are other mathematical forms to represent the cases where the elasticity of substitution is greater than one or less than one. The case of infinite elasticity corresponds to a linear production function: output is given $Y = F(K, L) = rK + vL$ (so that the return on capital r does not depend on the quantities of capital and labor involved, nor does the return on labor v , which is just the wage rate, also fixed in this example). See the online technical appendix.
18. See Charles Cobb and Paul Douglas, “A Theory of Production,” *American Economic Review* 18, no. 1 (March 1928): 139–65.
19. According to Bowley’s calculations, capital’s share of national income throughout the period was about 37 percent and labor’s share about 63 percent. See Arthur Bowley, *The Change in the Distribution of National Income, 1880–1913* (Oxford: Clarendon Press, 1920). These estimates are consistent with my findings for this period. See the online technical appendix.
20. See Jürgen Kuczynski, *Labour Conditions in Western Europe 1820 to 1935* (London: Lawrence and Wishart, 1937). That same year, Bowley extended his work from 1920: see Arthur Bowley, *Wages and Income in the United Kingdom since 1860* (Cambridge: Cambridge University Press, 193). See also Jürgen Kuczynski, *Geschichte der Lage der Arbeiter unter dem Kapitalismus*, 38 vols. (Berlin, 1960–72). Volumes 32, 33, and 34 are devoted to France. For a critical analysis of Kuczynski’s series, which remain a valuable historical source despite their lacunae, see Thomas Piketty, *Les hauts revenus en France au 20e siècle: Inégalités et redistribution 1901–1998* (Paris: Grasset, 2001), 677–681. See the online technical appendix for additional references.

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21. See Frederick Brown, “Labour and Wages,” *Economic History Review* 9, no. 2 (May 1939): 215–17.
22. See J. M. Keynes, “Relative Movement of Wages and Output,” *Economic Journal* 49 (1939): 48. It is interesting to note that in those days the proponents of a stable capital-labor split were still unsure about the supposedly stable level of this split. In this instance Keynes insisted on the fact that the share of income going to “manual labor” (a category difficult to define over the long run) seemed stable at 40 percent of national income between 1920 and 1930.
23. See the online technical appendix for a complete bibliography.
24. See the online technical appendix.
25. This might take the form of an increase in the exponent $1 - \alpha$ in the Cobb-Douglas production function (and a corresponding decrease in α) or similar modifications to the more general production functions in which elasticities of substitution are greater or smaller than one. See the online technical appendix.
26. See the online technical appendix.
27. See Jean Bouvier, François Furet, and M. Gilet, *Le mouvement du profit en France au 19e siècle: Matériaux et études* (Paris: Mouton, 1965).
28. See François Simiand, *Le salaire, l'évolution sociale et la monnaie* (Paris: Alcan, 1932); Ernest Labrousse, *Esquisse du mouvement des prix et des revenus en France au 18e siècle* (Paris: Librairie Dalloz, 1933). The historical series assembled by Jeffrey Williamson and his colleagues on the long-term evolution of land rents and wages also suggest an increase in the share of national income going to land rent in the eighteenth and early nineteenth centuries. See the online technical appendix.
29. See A. Chabert, *Essai sur les mouvements des prix et des revenus en France de 1798 à 1820*, 2 vols. (Paris: Librairie de Médecis, 1945–49). See also Gilles Postel-Vinay, “A la recherche de la révolution économique dans les campagnes (1789–1815),” *Revue économique*, 1989.
30. A firm’s “value added” is defined as the difference between what it earns by selling goods and services (called “sales revenue” in English) and what it pays other firms for its purchases (called “intermediate consumption”). As the name indicates, this sum measures the value the firm adds in the process of production. Wages are paid out of value added, and what is left over is by definition the firm’s profit. The study of the capital-labor split is too often limited to the wage-profit split, which neglects rent.
31. The notion of permanent and durable population growth was no clearer, and the truth is that it remains as confused and frightening today as it ever was, which is why the hypothesis of stabilization of the global population is generally accepted. See Chapter 2.
32. The only case in which the return on capital does not tend toward zero is in a “robotized” economy with an infinite elasticity of substitution between capital and labor, so that production ultimately uses capital alone. See the online technical appendix.
33. The most interesting tax data are presented in appendix 10 of book 1 of *Capital*. See the online technical appendix for an analysis of some of the calculations of profit shares and rates of exploitation based on the account books presented by

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Marx. In *Wages, Price, and Profit* (1865) Marx also used the accounts of a highly capitalistic factory in which profits attained 50 percent of value added (as large a proportion as wages). Although he does not say so explicitly, this seems to be the type of overall split he had in mind for an industrial economy.

34. See Chapter 1.
35. Some recent theoretical models attempt to make this intuition explicit. See the online technical appendix.
36. To say nothing of the fact that some of the US economists (starting with Modigliani) argued that capital had totally changed its nature (so that it now stemmed from accumulation over the life cycle), while the British (starting with Kaldor) continued to see wealth in terms of inheritance, which was significantly less reassuring. I return to this crucial question in Part Three.

7. *Inequality and Concentration: Preliminary Bearings*

1. Honoré de Balzac, *Le père Goriot* (Paris: Livre de Poche, 1983), 123–135.
2. See Balzac, *Le père Goriot*, 131. To measure income and wealth, Balzac usually used francs or livres tournois (which became equivalent once the franc “germinal” was in place) as well as écus (an écu was a silver coin worth 5 francs in the nineteenth century), and more rarely louis d’or (a louis was a gold coin worth 20 francs, which was already worth 20 livres under the Ancien Régime). Because inflation was nonexistent at the time, all these units were so stable that readers could move easily from one to another. See Chapter 2. I discuss the amounts mentioned by Balzac in greater detail in Chapter 11.
3. See Balzac, *Le père Goriot*, 131.
4. According to the press, the son of a former president of France, while studying law in Paris, recently married the heiress of the Darty chain of appliance stores, but he surely did not meet her at the Vauquer boardinghouse.
5. I define deciles in terms of the adult population (minors generally earn no income) and, insofar as possible, at the individual level. The estimates in Tables 7.1–3 are based on this definition. For some countries, such as France and the United States, the historical data on income are available only at the household level (so that the incomes of both partners in a couple are added). This slightly modifies the shares of the various deciles but has little effect on the long-term evolutions that are of interest here. For wages, the historical data are generally available at the individual level. See the online technical appendix.
6. See the online technical appendix and Supplemental Table S7.1, available online.
7. The median is the level below which half the population lies. In practice, the median is always lower than the mean, or average, because real-world distributions always have long upper tails, which raises the mean but not the median. For incomes from labor, the median is typically around 80 percent of the mean (e.g., if the average wage is 2,000 euros a month, the median is around 1,600 euros). For wealth, the median can be extremely low, often less than 50 percent

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of mean wealth, or even zero if the poorer half of the population owns almost nothing.

8. “What is the Third Estate? Everything. What has it been in the political order until now? Nothing. What does it want? To become something.”
9. As is customary, I have included replacement incomes (i.e., pensions and unemployment insurance intended to replace lost income from labor and financed by wage deductions) in primary income from labor. Had I not done this, inequality of adult income from labor would be noticeably—and to some extent artificially—greater than indicated in Tables 7.1 and 7.3 (given the large number of retirees and unemployed workers whose income from labor is zero). In Part Four I will come back to the question of redistribution by way of pensions and unemployment insurance, which for the time being I treat simply as “deferred wages.”
10. These basic calculations are detailed in Supplemental Table S7.1, available online.
11. The top decile in the United States most likely owns something closer to 75 percent of all wealth.
12. See the online technical appendix.
13. It is difficult to say whether this criterion was met in the Soviet Union and other countries of the former Communist bloc, because the data are not available. In any case, the government owned most of the capital, a fact that considerably diminishes the interest of the question.
14. Note that inequality remains high even in the “ideal society” described in Table 7.2. (The richest 10 percent own more capital than the poorest 50 percent, even though the latter group is 5 times larger; the average wealth of the richest 1 percent is 20 times greater than that of the poorest 50 percent.) There is nothing preventing us from aiming at more ambitious goals.
15. Or 400,000 euros on average per couple.
16. See Chapters 3–5. The exact figures are available in the online technical appendix.
17. On durable goods, see Chapter 5 and the online technical appendix.
18. Exactly $35/9 \times 200,000$ euros, or 777,778 euros. See Supplemental Table S7.2, available online.
19. To get a clearer idea of what this means, we can continue the arithmetic exercise described above. With an average wealth of 200,000 euros, “very high” inequality of wealth as described in Table 7.2 meant an average wealth of 20,000 euros for the poorest 50 percent, 25,000 euros for the middle 40 percent, and 1.8 million euros for the richest 10 percent (with 890,000 for the 9 percent and 10 million for the top 1 percent). See the online technical appendix and Supplemental Tables S7.1–3, available online.
20. If we look only at financial and business capital, that is, at control of firms and work-related tools, then the upper decile’s share is 70–80 percent or more. Firm ownership remains a relatively abstract concept for the vast majority of the population.
21. The increasing association of the two dimensions of inequality might, for example, be a consequence of the increase in university attendance. I will come back to this point later.

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22. These calculations slightly underestimate the true Gini coefficients, because they are based on the hypothesis of a finite number of social groups (those indicated in Tables 7.1–3), whereas the underlying reality is a continuous wealth distribution. See the online technical appendix and Supplemental Tables S7.4–6 for the detailed results obtained with different numbers of social groups.
23. Other ratios such as P₉₀/P₅₀, P₅₀/P₁₀, P₇₅/P₂₅, etc. are also used. (P₅₀ indicates the fiftieth percentile, that is, the median, while P₂₅ and P₇₅ refer to the twenty-fifth and seventy-fifth percentiles, respectively.)
24. Similarly, the decision whether to measure inequalities at the individual or household level can have a much larger—and especially more volatile—effect on interdecile ratios of the P₉₀/P₁₀ type (owing in particular to the fact that in many cases women do not work outside the home) than on the bottom half’s share of total income.
25. See in particular Joseph E. Stiglitz, Amartya Sen, and Jean-Paul Fitoussi, Report by the Commission on the Measurement of Economic Performance and Social Progress, 2009 (www.stiglitz-sen-fitoussi.fr)
26. Social tables were similar, in spirit at least, to the famous *Tableau économique* that François Quesnay published in 1758, which provided the first synthetic picture of the economy and of exchanges between social groups. One can also find much older social tables from any number of countries from antiquity on. See the interesting tables described by B. Milanovic, P. Lindert, and J. Williamson in “Measuring Ancient Inequality,” NBER Working Paper 13550 (October 2007). See also B. Milanovic, *The Haves and the Have-Nots: A Brief and Idiosyncratic History of Global Inequality* (New York: Basic Books, 2010). Unfortunately, the data in these early tables are not always satisfactory from the standpoint of homogeneity and comparability. See the online technical appendix.

8. *Two Worlds*

1. See Table 7.3.
2. See Table 7.1 and the online technical appendix.
3. For complete series for the various centiles and up to the top ten-thousandth, as well as a detailed analysis of the overall evolution, see Thomas Piketty, *Les hauts revenus en France au 20e siècle: Inégalités et redistribution 1901–1998* (Paris: Grasset, 2001). Here I will confine myself to the broad outlines of the story, taking account of more recent research. The updated series are also available online in the WTID.
4. The estimates shown in Figures 8.1 and 8.2 are based on declarations of income and wages (the general income tax was instituted in France in 1914, and the so-called *cédulaire* tax on wages was adopted in 1917, so we have separate annual measures of high incomes and high wages starting from those two dates) and on national accounts (which tell us about total national income and total wages paid), using a method initially introduced by Kuznets and described briefly in the

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introduction. The fiscal data begin only with income for 1915 (the first year in which the new tax was levied), and I have completed the series for 1910–1914 using estimates carried out before the war by the tax authorities and contemporary economists. See the online technical appendix.

5. In Figure 8.3 (and subsequent figures of similar type) I have used the same notations as in *Les hauts revenus en France* and the WTID to designate the various “fractiles” of the income hierarchy: P90–95 includes everyone between the ninetieth and ninety-fifth percentile (the poorer half of the richest 10 percent), P95–99 includes those between the ninety-fifth and ninety-ninth percentile (the next higher 4 percent), P99–99.5 the next 0.5 percent (the poorer half of the top 1 percent), P99.5–99.9 the next 0.4 percent, P99.9–99.99 the next 0.09 percent, and P99.99–100 the riches 0.01 percent (the top ten-thousandth).
6. As a reminder, the top centile in France in 2010 consists of 500,000 adults out of an adult population of 50 million.
7. As is also the case for the nine-tenths of the population below the ninetieth percentile, but here compensation in the form of wages (or replacement pay in the form of retirement income or unemployment insurance) is lower.
8. The pay scales for civil servants are among the pay hierarchies about which we have the most long-term data. In France in particular, we have detailed information from state budgets and legislative reports going back to the beginning of the nineteenth century. Private sector pay has to be divined from tax records, hence is little is known about the period prior to the creation of the income tax in 1914–1917. The data we have about civil service pay suggest that the wage hierarchy in the nineteenth century was roughly similar to what we see in the period 1910–2010 for both the top decile and the bottom half, although the top centile may have been slightly higher (without reliable private sector data we cannot be more precise). See the online technical appendix.
9. In 2000–2010, the share of wages in the P99–99.5 and P99.5–99.9 fractiles (which constitute nine-tenths of the top centile) was 50–60 percent, compared with 20–30 percent for mixed incomes (see Figure 8.4). High salaried incomes dominated high mixed incomes to almost the same degree as in the interwar years (see Figure 8.3).
10. As in Chapter 7, the euro figures cited here are deliberately rounded off and approximate, so they are no more than indications of orders of magnitude. The exact thresholds of each centile and thousandth are available in the online technical appendix, year by year.
11. Note, however, that the data on which these boundaries are based are imperfect. As noted in Chapter 6, some entrepreneurial income may be disguised as dividends and therefore classed as income from capital. For a detailed, year-by-year analysis of the composition of the top centiles and thousandths of income in France since 1914, see Piketty, *Les hauts revenus en France*, 93–168.
12. Income from capital seems to represent less than 10 percent of the income of “the 9 percent” in Figure 8.4, but that is solely a result of the fact that these figures, like

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the series on the shares of the top decile and centile, are based exclusively on self-declared income statements, which since 1960 have excluded so-called fictive rents (that is, the rental value of owner-occupied housing, which was previously part of taxable income). If we included nontaxable capital income (such as fictive rents), the share of income from capital among “the 9 percent” would reach and even slightly exceed 20 percent in 2000–2010. See the online technical appendix.

13. See the online technical appendix.
14. In particular, I always include all rents, interest, and dividends in income declarations, even when some of these types of income are not subject to the same tax schedule and may be covered by specific exemptions or reduced rates.
15. See the online technical appendix.
16. Note that throughout World War II, the French tax authorities carried on with their work of collecting income statements, recording them, and compiling statistics based on them as if nothing had changed. Indeed, it was a golden age of mechanical data processing: new technologies allowed for automated sorting of punched cards, which made it possible to do rapid cross-tabulations, a great advance over previous manual methods. Hence the statistical publications of the Ministry of Finance during the war years were richer than ever before.
17. The share of the upper decile decreased from 47 to 29 percent of national income, and that of the upper centile from 21 to 7 percent. Details are available in the online technical appendix.
18. For a detailed analysis of all these evolutions, year by year, see *Les hauts revenus en France*, esp. chaps. 2 and 3, pp. 93–229.
19. In World War II, the compression of the wage hierarchy actually began before the war, in 1936, with the Matignon Accords.
20. See *Les hauts revenus en France*, 201–202. The very sharp break in wage inequality that occurred in 1968 was recognized at the time. See in particular the meticulous work of Christian Baudelot and A. Lebeauvin, *Les salaires de 1950 à 1975* (Paris: INSEE, 1979).
21. See Figure 6.6.
22. See esp. the work of Camille Landais, “Les hauts revenus en France (1998–2006): Une explosion des inégalités?” (Paris: Paris School of Economics, 2007), and Olivier Godechot, “Is Finance Responsible for the Rise in Wage Inequality in France?” *Socio-Economic Review* 10, no. 3 (2012): 447–70.
23. For the years 1910–1912 I completed the series by using various available data sources, and in particular various estimates carried out by the US government in anticipation of the creation of a federal income tax (just as I did in the case of France). See the online technical appendix.
24. For the years 1913–1926, I used data on income level and categories of income to estimate the evolution of wage inequality. See the online technical appendix.
25. Two recent books about the rise of inequality in the United States by well-known economists demonstrate the strength of the attachment to this relatively egalitarian period of US history: Paul Krugman, *The Conscience of a Liberal* (New York:

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- Norton, 2007), and Joseph Stiglitz, *The Price of Inequality* (New York: Norton, 2012).
26. The available data, though imperfect, suggest that the correction for understatement of capital income might add two to three points of national income. The uncorrected share of the upper decile was 49.7 percent in 1007 and 47.9 percent in 2010 (with a clear upward trend). See the online technical appendix.
 27. The series “with capital gains” naturally include capital gains in both the numerator (for the top income deciles and centiles) and the denominator (for total national income); the series “without capital gains” exclude them in both cases. See the online technical appendix.
 28. The only suspicious jump takes place around the time of the major Reagan tax reform of 1986, when a number of important firms changed their legal form in order to have their profits taxed as personal rather than corporate income. This transfer between fiscal bases had purely short-term effects (income that should have been realized a little later as capital gains was realized somewhat earlier) and played a secondary role in shaping the long-term trend. See the online technical appendix.
 29. The annual pretax incomes mentioned here correspond to household incomes (married income or single individual). Income inequality at the individual level increased by approximately the same proportion as inequality in terms of household income. See the online technical appendix.
 30. This visceral appreciation of the economy is sometimes particularly noticeable among economists teaching in US universities but born in foreign countries (generally poorer than the United States), an appreciation that is again quite comprehensible..
 31. All detailed series are available in the online technical appendix.
 32. This argument is more and more widely accepted. It is defended, for example, by Michael Kumhof and Romain Rancière, “Inequality, Leverage, and Crises,” International Monetary Fund Working Paper (November 2010). See also Raghuram G. Rajan, *Fault Lines* (Princeton, NJ: Princeton University Press, 2010), which nevertheless underestimates the importance of the growing share of US national income claimed by the top of the income hierarchy.
 33. See Anthony B. Atkinson, Thomas Piketty, and Emmanuel Saez, “Top Incomes in the Long Run of History,” *Journal of Economic Literature* 49, no. 1(2011): Table 1, p. 9.
 34. Remember that these figures all concern the distribution of primary income (before taxes and transfers). I examine the effects of taxes and transfers in Part Four. To put it in a nutshell, the progressivity of the tax system was significantly reduced in this period, which makes the numbers worse, while increases in some transfers to the poorest individuals slightly alleviate them.
 35. See Chapter 5, where the Japanese and Spanish bubbles are discussed.
 36. See Thomas Piketty and Emmanuel Saez, “Income Inequality in the United States, 1913–1998,” *Quarterly Journal of Economics* 118, no. 1 (February 2003): 29–30. See also Claudia Goldin and R. Margo, “The Great Compression: The Wage

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- Structure in the United States at Mid-Century,” *Quarterly Journal of Economics* 107, no. 1 (February 1992): 1–34.
37. Nor was it compensated by greater intergenerational mobility; quite the contrary. I come back to this point in Chapter 13.
 38. See Wojciech Kopczuk, Emmanuel Saez, and Jae Song, “Earnings Inequality and Mobility in the United States: Evidence from Social Security Data since 1937,” *Quarterly Journal of Economics* 125, no. 1 (2010): 91–128.
 39. See Edward N. Wolff and Ajit Zacharias, “Household Wealth and the Measurement of Economic Well-Being in the U.S.,” *Journal of Economic Inequality* 7, no. 2 (June 2009): 83–115. Wolff and Zacharias correctly remark that my initial article with Emmanuel Saez in 2003 overstated the degree to which the evolutions we observed could be explained by the substitution of “working rich” for “coupon-clipping rentiers,” when in fact what one finds is rather a “cohabitation” of the two.
 40. See Supplemental Figures S8.1 and S8.2, available online.
 41. See Steven N. Kaplan and Joshua Rauh, “Wall Street and Main Street: What Contributes to the Rise of the Highest Incomes?” *Review of Financial Studies* 23, no. 3 (March 2009): 1004–1050.
 42. See Jon Bakija, Adam Cole, and Bradley T. Heim, “Jobs and Income Growth of Top Earners and the Causes of Changing Income Inequality: Evidence from U.S. Tax Return Data,” Department of Economics Working Papers 2010–24, Department of Economics, Williams College, Table 1. Other important professional groups include doctors and lawyers (about 10 percent of the total) and real estate promoters (around 5 percent). These data should be used with caution, however: we do not know the origin of the fortunes involved (whether inherited or not), but income from capital accounts for more than half of all income at the level of the top thousandth if capital gains are included (see Figure 8.10) and about a quarter if they are excluded (see Supplemental Figure S8.2, available online).
 43. “Superentrepreneurs” of the Bill Gates type are so few in number that they are not relevant for the analysis of income and are best studied in the context of an analysis of fortunes and in particular the evolution of different classes of fortune. See Chapter 12.
 44. Concretely, if a manager is granted options that allow him to buy for \$100 stock in the company valued at \$200 when he exercises the option, then the difference between the two prices—in this case \$100—is treated as a component of the manager’s wage in the year in which the option is exercised. If he later sells the shares of stock for an even higher price, say \$250, then the difference, \$50, is recorded as a capital gain.

9. *Inequality of Labor Income*

1. Claudia Dale Goldin and Lawrence F. Katz, *The Race between Education and Technology: The Evolution of U.S. Educational Wage Differentials, 1890–2005* (Cambridge, MA: Belknap Press, 2010).

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2. See Table 7.2.
3. In the language of national accounting, expenditures on health and education are counted as consumption (a source of intrinsic well-being) and not investment. This is yet another reason why the expression “human capital” is problematic.
4. There were of course multiple subepisodes within each phase: for instance, the minimum wage increased by about 10 percent between 1998 and 2002 in order to compensate for the reduction of the legal work week from 39 hours to 35 hours while preserving the same monthly wage.
5. As in the case of the federal income tax, the minimum wage legislation resulted in a fierce battle between the executive branch and the Supreme Court, which overturned the first minimum wage law in 1935, but Roosevelt reintroduced it in 1938 and ultimately prevailed.
6. In Figure 9.1, I have converted nominal minimum wages into 2013 euros and dollars. See Supplemental Figures S9.1–2, available online, for the nominal minimum wages.
7. Some states have a higher minimum wage than the federal minimum in 2013: in California and Massachusetts, the minimum is \$8 an hour; in Washington state it is \$9.19.
8. At an exchange rate of 1.30 euros per pound. In practice, the gap between the British and French minimum wages is larger because of the difference in employer social security payments (which are added to the gross wage). I come back to this point in Part Four.
9. Important differences persist between countries: in Britain, for example, many prices and incomes (including rents, allowances, and some wages) are set by the week and not the month. On these questions, see Robert Castel, *Les Métamorphoses de la question sociale: Une chronique du salariat* (Paris: Fayard, 1995).
10. See in particular David Card and Alan Krueger, *Myth and Measurement: The New Economics of the Minimum Wage* (Princeton: Princeton University Press, 1995). Card and Krueger exploited numerous cases in which neighboring states had different minimum wages. The pure “monopsony” case is one in which a single employer can purchase labor in a given geographical area. (In pure monopoly, there is a single seller rather than a single buyer.) The employer then sets the wage as low as possible, and an increase in the minimum wage does not reduce the level of employment, because the employer’s profit margin is so large as to make it possible to continue to hire all who seek employment. Employment may even increase, because more people will seek work, perhaps because at the higher wage they prefer work to illegal activities, which is a good thing, or because they prefer work to school, which may not be such a good thing. This is precisely what Card and Krueger observed.
11. See in particular Figures 8.6–8.
12. This fact is crucial but often neglected in US academic debate. In addition to the work of Goldin and Katz, *Race between Education and Technology*, see also the recent work of Rebecca Blank, *Changing Inequality* (Berkeley: University of Cali-

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ifornia Press, 2011), which is almost entirely focused on the evolution of the wage difference associated with a college diploma (and on the evolution of family structures). Raghuram Rajan, *Fault Lines* (Princeton: Princeton University Press, 2010), also seems convinced that the evolution of inequality related to college is more significant than the explosion of the 1 percent (which is incorrect). The reason for this is probably that the data normally used by labor and education economists do not give the full measure of the overperformance of the top centile (one needs tax data to see what is happening). The survey data have the advantage of including more sociodemographic data (including data on education) than tax records do. But they are based on relatively small samples and also raise many problems having to do with respondents' self-characterization. Ideally, both types of sources should be used together. On these methodological issues, see the online technical appendix.

13. Note that the curves in Figure 9.2 and subsequent figures do not take account of capital gains (which are not consistently measured across countries). Since capital gains are particularly large in the United States (making the top centile's share of national income more than 20 percent in the 2000s if we count capital gains), the gap is in fact wider than indicated in Figure 9.2. See, for example, Supplemental Figure S9.3, available online.
14. New Zealand followed almost the same trajectory as Australia. See Supplemental Figure S9.4, available online. In order to keep the figures simple, I have presented only some of the countries and series available. Interested readers should consult the online technical appendix or the WTID for the complete series.
15. Indeed, if we include capital gains, which were strong in Sweden in the period 1990–2010, the top centile's share reached 9 percent. See the online technical appendix.
16. All the other European countries in the WTID, namely, the Netherlands, Switzerland, Norway, Finland, and Portugal, evolved in ways similar to those observed in other continental European countries. Note that we have fairly complete data for southern Europe. The series for Spain goes back to 1933, when an income tax was created, but there are several breaks. In Italy, the income tax was created in 1923, but complete data are not available until 1974. See the online technical appendix.
17. The share of the top thousandth exceeded 8 percent in the United States in 2000–2010 if we omit capital gains and 12 percent if we include them. See the online technical appendix.
18. The “0.1 percent” in France and Japan therefore increased from 15 to 25 times the national average income (that is, from 450,000 to 750,000 euros a year if the average is 30,000), while the top “0.1 percent” in the United States rose from 20 to 100 times the national average (that is, from \$600,000 a year to \$3 million). These orders of magnitude are approximate, but they give us a better sense of the phenomenon and relate shares to the salaries often quoted in the media.
19. The income of “the 1 percent” is distinctly lower: a share of 10 percent of national income for the 1 percent means by definition that their average income is 10 times

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- higher than the national average (a share of 20 percent would indicate an average 20 times higher than the national average, and so on). The Pareto coefficient, about which I will say more in Chapter 10, enables us to relate the shares of the top decile, top centile, and top thousandth: in relatively egalitarian countries (such as Sweden in the 1970s), the top 0.1 percent earned barely twice as much as the top 1 percent, so that the top thousandth's share of national income was barely one-fifth of the top centile's. In highly inegalitarian countries (such as the United States in the 2000s), the top thousandth earns 4 to 5 times what the top centile earns, and the top thousandth's share is 40 to 50 percent of the top centile's share.
20. Depending on whether capital gains are included or not. See the online technical appendix for the complete series.
 21. See, in particular, Table 5.1.
 22. For Sweden and Denmark, in some years in the period 1900–1910, we find top centile shares of 25 percent of national income, higher than the levels seen in Britain, France, and Germany at that time (where the maximum was closer to 22 or 23 percent). Given the limitations of the available sources, it is not certain that these differences are truly significant, however. See the online technical appendix.
 23. For all the countries for which we have data on the composition of income at different levels, comparable to the data presented for France and the United States in the previous chapter (see Figures 8.3–4 and 8.9–10), we find the same reality.
 24. See Supplemental Figure S9.6, available online, for the same graph using annual series. Series for other countries are similar and available online.
 25. Figure 9.8 simply shows the arithmetic mean of the four European countries included in Figure 9.7. These four countries are quite representative of European diversity, and the curve would not look very different if we included other northern and southern European countries for which data are available, or if we weighted the average by the national income of each country. See the online technical appendix.
 26. Interested readers may wish to consult the case studies of twenty-three countries that Anthony Atkinson and I published in two volumes in 2007 and 2010: *Top Incomes over the Twentieth Century: A Contrast Between Continental European and English-Speaking Countries* (Oxford: Oxford University Press, 2007), and *Top Incomes: A Global Perspective* (Oxford: Oxford University Press, 2010).
 27. In China, strictly speaking, there was no income tax before 1980, so there is no way to study the evolution of income inequality for the entire twentieth century (the series presented here began in 1986). For Colombia, the tax records I have collected thus far go back only to 1993, but the income tax existed well before that, and it is entirely possible that we will ultimately find the earlier data (the archives of historical tax records are fairly poorly organized in a number of South American countries).
 28. The list of ongoing projects is available on the WTID site.
 29. When digital tax files are accessible, computerization naturally leads to improvement in our sources of information. But when the files are closed or poorly in-

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- dexed (which often happens), then the absence of statistical data in paper form can impair our “historical memory” of income tax data.
30. The closer the income tax is to being purely proportional, the less the need for detailed information about different income brackets. In Part Four I will discuss changes in taxation itself. The point for now is that such changes have an influence on our observational instruments.
 31. The information for the year 2010 in Figure 9.9 is based on very imperfect data concerning the remuneration of firm managers and should be taken as a first approximation. See the online technical appendix.
 32. See Abhijit Banerjee and Thomas Piketty, “Top Indian Incomes, 1922–2000,” *World Bank Economic Review* 19, no. 1 (May 2005): 1–20. See also A. Banerjee and T. Piketty, “Are the Rich Growing Richer? Evidence from Indian Tax Data,” in Angus Deaton and Valerie Kozel, eds., *Data and Dogma: The Great Indian Poverty Debate* (New Delhi: Macmillan India Ltd., 2005): 598–611. The “black hole” itself represents nearly half of total growth in India between 1990 and 2000: per capita income increased by nearly 4 percent a year according to national accounts data but by only 2 percent according to household survey data. The issue is therefore important.
 33. See the online technical appendix.
 34. In fact, the principal—and on the whole rather obvious—result of economic models of optimal experimentation in the presence of imperfect information is that it is never in the interest of the agents (in this case the firm) to seek complete information as long as experimentation is costly (and it is costly to try out a number of CFOs before making a final choice), especially when information has a public value greater than its private value to the agent. See the online technical appendix for bibliographic references.
 35. See Marianne Bertrand and Sendhil Mullainathan, “Are CEOs Rewarded for Luck? The Ones without Principals Are,” *Quarterly Journal of Economics* 116, no. 3 (2001): 901–932. See also Lucian Bebchuk and Jesse Fried, *Pay without Performance* (Cambridge, MA: Harvard University Press, 2004).

10. *Inequality in Capital Ownership*

1. In particular, all the data on the composition of income by level of overall income corroborate this finding. The same is true of series beginning in the late nineteenth century (for Germany, Japan, and several Nordic countries). The available data for the poor and emergent countries are more fragmentary but suggest a similar pattern. See the online technical appendix.
2. See esp. Table 7.2.
3. The parallel series available for other countries give consistent results. For example, the evolutions we observe in Denmark and Norway since the nineteenth century are very close to the trajectory of Sweden. The data for Japan and Germany suggest a dynamic similar to that of France. A recent study of Australia

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yields results consistent with those obtained for the United States. See the online technical appendix.

4. For a precise description of the various sources used, see Thomas Piketty, “On the Long-Run Evolution of Inheritance: France 1820–2050,” Paris School of Economics, 2010 (a summary version appeared in the *Quarterly Journal of Economics*, 126, no. 3 [August 2011]: 1071–1131). The individual statements were collected with Gilles Postel-Vinay and Jean-Laurent Rosenthal from Parisian archives. We also used statements previously collected for all of France under the auspices of the Enquête TRA project, thanks to the efforts of numerous other researchers, in particular Jérôme Bourdieu, Lionel Kesztenbaum, and Akiko Suwa-Eisenmann. See the online technical appendix.
5. For a detailed analysis of these results, see Thomas Piketty, Gilles Postel-Vinay, and Jean-Laurent Rosenthal, “Wealth Concentration in a Developing Economy: Paris and France, 1807–1994,” *American Economic Review* 96, no. 1 (February 2006): 236–56. The version presented here is an updated version of these series. Figure 10.1 and subsequent figures focus on means by decade in order to focus attention on long-term evolutions. All the annual series are available online.
6. The shares of each decile and centile indicated in Figures 10.1 and following were calculated as percentages of total private wealth. But since private fortunes made up nearly all of national wealth, this makes little difference.
7. This method, called the “mortality multiplier,” involves a reweighting of each observation by the inverse of the mortality rate in each age cohort: a person who dies at age forty represents more living individuals than a person who dies at eighty (one must also take into account mortality differentials by level of wealth). The method was developed by French and British economists and statisticians (especially B. Mallet, M. J. Séaillès, H. C. Strutt, and J. C. Stamp) in 1900–1910 and used in all subsequent historical research. When we have data from wealth surveys or annual wealth taxes on the living (as in the Nordic countries, where such taxes have existed since the beginning of the twentieth century, or in France, with data from the wealth tax of 1990–2010), we can check the validity of this method and refine our hypotheses concerning mortality differentials. On these methodological issues, see the online technical appendix.
8. See the online technical appendix. This percentage probably exceeded 50 prior to 1789.
9. On this question, see also Jérôme Bourdieu, Gilles Postel-Vinay, and Akiko Suwa-Eisenmann, “Pourquoi la richesse ne s’est-elle pas diffusée avec la croissance? Le degré zéro de l’inégalité et son évolution en France: 1800–1940,” *Histoire et mesure* 18, 1/2 (2003): 147–98.
10. See for example the interesting data on the distribution of land in Roger S. Bagnall, “Landholding in Late Roman Egypt: The Distribution of Wealth,” *Journal of Roman Studies* 82 (November 1992): 128–49. Other work of this type yields similar results. See the online technical appendix.
11. Bibliographic and technical details can be found in the online technical appendix.

12. Some estimates find that the top centile in the United States as a whole owned less than 15 percent of total national wealth around 1800, but that finding depends entirely on the decision to focus on free individuals only, which is obviously a controversial choice. The estimates that are reported here refer to the entire population (free and unfree). See the online technical appendix.
13. See Willford I. King, *The Wealth and Income of the People of the United States* (New York: MacMillan, 1915). King, a professor of statistics and economics at the University of Wisconsin, relied on imperfect but suggestive data from several US states and compared them with European estimates, mainly based on Prussian tax statistics. He found the differences to be much smaller than he initially imagined.
14. These levels, based on official Federal Reserve Bank surveys, may be somewhat low (given the difficulty of estimating large fortunes), and the top centile's share may have reached 40 percent. See the online technical appendix.
15. The European average in Figure 10.6 was calculated from the figures for France, Britain, and Sweden (which appear to have been representative). See the online technical appendix.
16. For land rent, the earliest data available for antiquity and the Middle Ages suggest annual returns of around 5 percent. For interest on loans, we often find rates above 5 percent in earlier periods, typically on the order of 6–8 percent, even for loans with real estate collateral. See, for example, the data collected by S. Homer and R. Sylla, *A History of Interest Rates* (New Brunswick, NJ: Rutgers University Press, 1996).
17. If the return on capital were greater than the time preference, everyone would prefer to reduce present consumption and save more (so that the capital stock would grow indefinitely, until the return on capital fell to the rate of time preference). In the opposite case, everyone would sell a portion of her capital stock in order to increase present consumption (and the capital stock would decrease until the return on capital rose to equal θ). In either case we are left with $r = \theta$.
18. The infinite horizon model implies an infinite elasticity of saving—and thus of the supply of capital—in the long run. It therefore assumes that tax policy cannot affect the supply of capital.
19. Formally, in the standard infinite horizon model, the equilibrium rate of return is given by the formula $r = \theta + \gamma \times g$ (where θ is the rate of time preference and γ measures the concavity of the utility function. It is generally estimated that γ lies between 1.5 and 2.5. For example, if $\theta = 5\%$ and $\gamma = 2$, then $r = 5\%$ for $g = 0\%$ and $r = 9\%$ for $g = 2\%$, so that the gap $r - g$ rises from 5% to 7% when growth increases from 0% to 2%. See the online technical appendix.
20. A third for parents with two children and a half for those with only one child.
21. Note that in 1807 Napoleon introduced the *majorat* for his imperial nobility. This allowed an increased share of certain landed estates linked to titles of nobility to go to the eldest males. Only a few thousand individuals were concerned. Moreover, Charles X tried to restore *substitutions héréditaires* for his own nobility in 1826. These throwbacks to the Ancien Régime affected only a small part of the population and were in any case definitively abolished in 1848.

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22. See Jens Beckert, *Inherited Wealth* (Princeton: Princeton University Press, 2008).
23. In theory, women enjoyed the same rights as men when it came to dividing estates, according to the Civil Code. But a wife was not free to dispose of her property as she saw fit: this type of asymmetry, in regard to opening and managing bank accounts, selling property, etc., did not totally disappear until the 1970s. In practice, therefore, the new law favored (male) heads of families: younger sons acquired the same rights as elder sons, but daughters were left behind. See the online technical appendix.
24. See Pierre Rosanvallon, *La société des égaux* (Paris: Le Seuil, 2011), 50.
25. The equation relating the Pareto coefficient to $r-g$ is given in the online technical appendix.
26. Clearly, this does not imply that the $r > g$ logic is necessarily the only force at work. The model and related calculations are obviously a simplification of reality and do not claim to identify the precise role played by each mechanism (various contradictory forces may balance each other). It does show, however, that the $r > g$ logic is by itself sufficient to explain the observed level of concentration. See the online technical appendix.
27. The Swedish case is interesting, because it combines several contradictory forces that seem to balance one another out: first, the capital/income ratio was lower than in France or Britain in the nineteenth and early twentieth centuries (the value of land was lower, and domestic capital was partly owned by foreigners—in this respect, Sweden was similar to Canada), and second, primogeniture was in force until the end of the nineteenth century, and some entails on large dynastic fortunes in Sweden persist to this day. In the end, wealth was less concentrated in Sweden in 1900–1910 than in Britain and close the French level. See Figures 10.1–4 and the work of Henry Ohlsson, Jesper Roine, and Daniel Waldenström.
28. Recall that the estimates of the “pure” return on capital indicated in Figure 10.10 should be regarded as minimums and that the average observed return rose as high as 6–7 percent in Britain and France in the nineteenth century (see Chapter 6).
29. Fortunately, Duchesse and her kittens ultimately meet Thomas O’Malley, an alley cat whose earthy ways they find more amusing than art classes (a little like Jack Dawson, who meets young Rose on the deck of *Titanic* two years later, in 1912).
30. For an analysis of Pareto’s data, see my *Les hauts revenus en France au 20^e siècle: Inégalités et redistribution 1901–1998* (Paris: Grasset, 2001), 527–530.
31. For details, see the online technical appendix.
32. The simplest way to think of Pareto coefficients is to use what are sometimes called “inverted coefficients,” which in practice vary from 1.5 to 3.5. An inverted coefficient of 1.5 means that average income or wealth above a certain threshold is equal to 1.5 times the threshold level (individuals with more than a million euros of property own on average 1.5 million euros’ worth, etc., for any given threshold), which is a relatively low level of inequality (there are few very wealthy individuals). By contrast, an inverted coefficient of 3.5 represents a very high level of inequality. Another way to think about power functions is the following: a coeffi-

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- cient around 1.5 means that the top 0.1 percent are barely twice as rich on average as the top 1 percent (and similarly for the top 0.01 percent within the top 0.1 percent, etc.). By contrast, a coefficient around 3.5 means that they are more than five times as rich. All of this is explained in the online technical appendix. For graphs representing the historical evolution of the Pareto coefficients throughout the twentieth century for the various countries in the WTID, see Anthony B. Atkinson, Thomas Piketty, and Emmanuel Saez, “Top Incomes in the Long Run of History,” *Journal of Economic Literature* 49, no. 1 (2011): 3–71.
33. That is, they had something like an income of 2–2.5 million euros a year in a society where the average wage was 24,000 euros a year (2,000 a month). See the online technical appendix.
 34. Paris real estate (which at the time consisted mainly of wholly owned buildings rather than apartments) was beyond the reach of the modestly wealthy, who were the only ones for whom provincial real estate, including especially farmland, still mattered. César Birotteau, who rejected his wife’s advice to invest in some good farms near Chinon on the grounds that this was too staid an investment, saw himself as bold and forward-looking—unfortunately for him. See Table S10.4 (available online) for a more detailed version of Table 10.1 showing the very rapid growth of foreign assets between 1872 and 1912, especially in the largest portfolios.
 35. The national solidarity tax, instituted by the ordinance of August 15, 1945, was an exceptional levy on all wealth, estimated as of June 4, 1945, at rates up to 20 percent for the largest fortunes, together with an exceptional levy on all nominal increases of wealth between 1940 and 1945, at rates up to 100 percent for the largest increases. In practice, in view of the very high inflation rate during the war (prices more than tripled between 1940 and 1945), this levy amounted to a 100 percent tax on anyone who did not sufficiently suffer during the war, as André Philip, a Socialist member of General de Gaulle’s provisional government, admitted, explaining that it was inevitable that the tax should weigh equally on “those who did not become wealthier and perhaps even those who, in monetary terms, became poorer, in the sense that their fortunes did not increase to the same degree as the general increase in prices, but who were able to preserve their overall fortunes at a time when so many people in France lost everything.” See André Siegfried, *L’Année Politique 1944–1945* (Paris: Editions du Grand Siècle, 1946), 159.
 36. See the online technical appendix.
 37. See in particular my *Les hauts revenus en France*, 396–403. See also Piketty, “Income Inequality in France, 1901–1998,” *Journal of Political Economy* 111, no. 5 (2003): 1004–42.
 38. See the simulations by Fabien Dell, “L’Allemagne inégale: Inégalités de revenus et de patrimoine en Allemagne, dynamique d’accumulation du capital et taxation de Bismarck à Schröder 1870–2005,” Ph.D. thesis, Paris School of Economics, 2008. See also F. Dell, “Top Incomes in Germany and Switzerland Over the Twentieth Century,” *Journal of the European Economic Association* 3, no. 2/3 (2005): 412–21.

II. Merit and Inheritance in the Long Run

1. I exclude theft and pillage, although these are not totally without historical significance. Private appropriation of natural resources is discussed in the next chapter.
2. In order to focus on long-term evolutions, I use averages by decade here. The annual series are available online. For more detail on techniques and methods, see Thomas Piketty, “On the Long-Run Evolution of Inheritance: France 1820–2050,” Paris School of Economics, 2010; a summary version was published in the *Quarterly Journal of Economics* 126, no. 3 (August 2011): 1071–131. These documents are available in the online technical appendix.
3. The discussion that follows is a little more technical than previous discussions (but necessary to understand what is behind the observed evolutions), and some readers may wish to skip a few pages and go directly to the implications and the discussion of what lies ahead in the twenty-first century, which can be found in the sections on Vautrin’s lecture and Rastignac’s dilemma.
4. The term μ is corrected to take account of gifts (see below).
5. In other words, one of every fifty adults dies each year. Since minors generally own very little capital, it is clearer to write the decomposition in terms of adult mortality (and to define μ in terms of adults alone). A small correction is then necessary to take account of the wealth of minors. See the online technical appendix.
6. On this subject, see Jens Beckett, trans. Thomas Dunlop, *Inherited Wealth* (Princeton: Princeton University Press, 2008), 291.
7. Becker never explicitly states the idea that the rise of human capital should eclipse the importance of inherited wealth, but it is often implicit in his work. In particular, he notes frequently that society has become “more meritocratic” owing to the increasing importance of education (without further detail). Becker has also proposed theoretical models in which parents can bequeath wealth to less gifted children, less well endowed with human capital, thereby reducing inequality. Given the extreme vertical concentration of inherited wealth (the top decile always owns more than 60 percent of the wealth available for inheritance, while the bottom half of the population owns nothing), this potential horizontal redistribution effect within groups of wealthy siblings (which, moreover, is not evident in the data, of which Becker makes almost no use) is hardly likely to predominate. See the online technical appendix.
8. Apart from the bloodletting of the two world wars, which is masked in my data by the use of decennial averages. See the online technical appendix for the annual series.
9. About 800,000 babies were born in France each year (actually between 750,000 and 850,000 with no trend up or down) from the late 1940s until the early 2010s, and according to official forecasts this will continue throughout the twenty-first century. In the nineteenth century there were about a million births per year, but the infant mortality rate was high, so the size of each adult cohort has varied little since the eighteenth century, except for the large losses due to war and the associated decline in births in the interwar years. See the online technical appendix.

10. The theory of the “rate of estate devolution” was particularly popular in France in the period 1880–1910, thanks to the work of Albert de Foville, Clément Colson, and Pierre Emile Levasseur, who were pleased to discover that their estimates of national wealth (obtained through a census of assets) were approximately equal to 30 times the annual inheritance flow. This method, sometimes called the “estate multiplier,” was also used in England, particularly by Giffen, even though British economists—who had access to limited estate tax statistics—generally used the capital income flows series coming from the scheduler income tax system.
11. In practice, both types of wealth are often mixed in the same financial products (reflecting the mixed motives of savers). In France, life insurance contracts sometimes include a share of capital that can be passed on to children and another, generally smaller share payable as an annuity (which ends with the death of the policy holder). In Britain and the United States, retirement funds and pension plans increasingly include a transmissible component.
12. To quote the usual proverb, public pensions are “the fortunes of those who have no fortune.” I will come back to this in Chapter 13, when I analyze different pension systems.
13. For detailed data on this subject, see Piketty, “On the Long-Run Evolution of Inheritance.”
14. Complete annual data are available online.
15. To be clear, these estimates include a fairly large correction for differential mortality (that is, for the fact the wealthy individuals on average live longer). This is an important phenomenon, but it is not the explanation for the profile described here. See the online technical appendix.
16. The annual growth rate of 1.7 percent is exactly the same as the average growth rate for 1980–2010. The estimate of net return on capital of 3 percent assumes that capital’s share of national income will continue at its average level for 1980–2010 and that the current tax system will remain in place. See the online technical appendix.
17. Other variants and scenarios are presented in the online technical appendix.
18. “Savings rates increase with income and initial endowment”: one can save more when one’s income is higher or when one does not have to pay rent, and even more when both conditions are true. “Wide variations in individual behavior”: some people like wealth, while others prefer automobiles or opera, for example.
19. For example, at a given income level, childless individuals save as much as others.
20. The growth of wages may drop even lower, if one subtracts the increasing proportion of national income that goes to finance pensions and health care.
21. For a more precise technical description of these simulations, which aim primarily to reproduce the evolution of the wealth profile by age group (on the basis of macroeconomic and demographic data), see the online technical appendix.
22. More precisely, one can show that $\mu \times m$ approaches $1/H$ when growth decreases, regardless of the life expectancy. With a capital/income ratio β of 600–700 percent, one may see why the inheritance flow b_y tends to return to β/H , that is,

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about 20–25 percent. Thus the idea of a “rate of estate devolution” developed by nineteenth-century economists is approximately correct in a society where growth is low. See the online technical appendix.

23. In reality, things are somewhat more complex, because we allow for the fact that some heirs consume a part of their inheritance. Conversely, we include in inherited wealth the cumulative income on wealth (within the limits of the heir’s wealth: if one fully capitalized all of the bequest, including the income consumed by the inheritor, for example in the form of rent that the inheritor of an apartment does not have to pay, one would obviously exceed 100 percent of total wealth). See the online technical appendix for estimates using different definitions.
24. In particular, when we say that the inheritance flow represents the equivalent of 20 percent of disposable income, this obviously does not mean that each individual receives 20 percent additional income every year in the form of a regular flow of bequests and gifts. It means rather that at certain points in a person’s life (typically on the death of a parent and in some cases on the occasion of receipt of a gift), much larger sums may be transferred, sums equivalent to several years’ income, and that all told these bequests and gifts represent the equivalent of 20 percent of the disposable income of all households.
25. Replacement incomes (retirement pensions and unemployment benefits) are included in income from labor, as in Part Two.
26. All resources were capitalized at the age of fifty, but if one uses the same rate of return to capitalize different resources, the choice of a reference age is not important for calculation the shares of inheritance and earned income in the total. The question of unequal returns on capital is examined in the next chapter.
27. For a complete analysis of the relations between these different ratios, see the online technical appendix. The fact that the inheritance flow (20–25 percent of national income) and capital income (typically 25–35 percent of national income) are sometimes close should be regarded as a coincidence due to specific demographic and technological parameters (the equilibrium inheritance flow $b_y = \beta/H$ depends on the capital/income ratio and the duration of a generation, whereas the equilibrium capital share α depends on the production function).
28. As a general rule, the bottom 50 percent of the income hierarchy collectively received about 30 percent of total earned income (see Table 7.1), and therefore individually received about 60 percent of the average wage (or 40–50 percent of average national income per capita, allowing for the fact that income from labor generally accounts for 65–75 percent of national income). For example, in France today, the least well paid 50 percent have incomes that range between the minimum wage and 1.5 times the minimum wage, and earn on average 15,000 euros a year (1,250 euros a month), compared with 30,000 euros a year (2,500 a month) for average per capita national income.
29. Recall that 6–7 percent of total wages for the top centile means that each member of that group earned on average 6–7 times the average wage, or 10–12 times the average wage of the least well paid 50 percent. See Chapters 7 and 8.

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30. Evolutions similar to those depicted in Figure 11.10 are obtained if one considers the top decile or top thousandth instead of the top centile (which I nevertheless believe is the most significant group to study). See Supplemental Figures S11.9–10, available online.
31. By definition, 500,000 adult individuals in a society of 50 million adults, such as France today.
32. The total value of inherited wealth is not far below its nineteenth-century level, but it has become rarer for individuals to inherit enough wealth to finance, without working, a lifestyle several dozen times the lower-class standard of living.
33. Roughly 3 times larger in the eighteenth and nineteenth centuries as well as the twenty-first century (when income from labor accounted for approximately three-quarters of total resources and income from inherited wealth for roughly one-quarter) and nearly 10 times larger in the twentieth century (when income from labor accounted for nine-tenths of resources and income from inherited wealth one-tenth). See Figure 11.9.
34. Roughly 3 times greater in the eighteenth and nineteenth centuries as well as the twenty-first century, and nearly 10 times larger in the twentieth century. The same would be true for the top 10 percent, the top 0.1 percent, etc.
35. See the online technical appendix for an analysis of the mathematical conditions on the various distributions that imply that rentiers dominate managers (and vice versa).
36. The top 1 percent of inherited fortunes enjoyed a standard of living 25–30 times higher than that of the bottom 50 percent in the nineteenth century (see Figure 11.10) or about 12–15 times the average per capita national income. The top 0.1 percent enjoyed a living standard approximately 5 times more opulent (see Chapter 10 on Pareto coefficients), or 60–75 times the average income. The threshold chosen by Balzac and Austen, 20–30 times average income, corresponds to the average income of the top 0.5 percent of the inheritance hierarchy (about 100,000 individuals out of an adult population of 20 million in France in 1820–1830, or 50,000 out of a population of 10 million British adults in 1800–1810). Both Balzac and Austen therefore had a vast range of characters to choose from.
37. In the nineteenth century, the best paid 1 percent of jobs offered a standard of living about 10 times greater than that of the lower class (see Figure 11.10), or 5 times the average income. One can estimate that only the best paid 0.01 percent (2,000 people out of 20 million at most) earned on average 20–30 times the average income for the period. Vautrin was probably not far off when he said that there were no more than five lawyers in Paris who earned more than 50,000 francs a year (or 100 times the average income). See the online technical appendix.
38. As in Chapter 2, the average incomes mentioned here are national per capita average incomes. In 1810–1820, the average income in France was 400–500 francs per year and probably a little more than 500 francs in Paris. The wages of domestic servants were one-third to one-half that.
39. Recall that a pound sterling was worth 25 francs in the nineteenth century and as late as 1914. See Chapter 2.

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40. Had not an intimate of George III said to Barry Lyndon thirty years earlier, in the 1770s, that anyone with a capital of 30,000 pounds ought to be knighted? Redmond Barry had come quite a way since enlisting in the British army for barely 15 pounds a year (1 shilling a day), or barely half the average British income in 1750–1760. The fall was inevitable. Note that Stanley Kubrick, who took his inspiration from the celebrated nineteenth-century British novel, is just as precise about amounts as Jane Austen was.
41. Jane Austen, *Sense and Sensibility* (Cambridge, MA: Belknap Press, 2013), 405.
42. Austen, *Sense and Sensibility*, 135.
43. His cynicism ultimately persuades Rastignac, who in *La maison de Nucingen* engages in business dealings with Delphine’s husband in order to lay hands on a fortune of 400,000 francs.
44. In October 1788, as he is about to leave Normandy, Young notes: “Europe is now so much assimilated, that if one goes to a house where the fortune is 15 or 20,000 livres a year, we shall find in the mode of living much more resemblance than a young traveller will ever be prepared to look for” (Arthur Young, *Travels in 1787, 1788, 1789*, pub. 1792, reprinted as *Arthur Young’s Travels in France* [Cambridge: Cambridge University Press, 2012, 145]). He is speaking of the livre tournois, equivalent to the franc germinal. This amount was equal to 700–900 pounds sterling, or the equivalent of 30–50 times the average French or British income of the day. Later on he is more specific: with this amount of income, one can afford “six men-servants, five maids, eight horses, a garden, and a regular table.” By contrast, with only 6,000–8,000 livres tournois, one can barely afford “2 servants and 3 horses.” Note that livestock was an important part of capital and expenses. In November 1789, Young sold his horse in Toulon for 600 livres tournois (or four years of annual wages for an “ordinary servant”). The price was typical for the time. See the online technical appendix.
45. Michael Young expressed this fear in *The Rise of Meritocracy* (London: Thames and Hudson, 1958).
46. The question of the salary scale for civil servants gave rise to many political conflicts in this period. In 1792, revolutionaries had tried to establish a restricted pay scale with a ratio of 8:1 (it was finally adopted in 1948 but was very quickly circumvented by a system of opaque bonuses for the highest civil servants that still exists today). Napoleon created a small number of highly paid posts, so few that Thiers in 1831 saw little reason to reduce their number (“with three million more or less given to or taken from the prefects, generals, magistrates, and ambassadors, we have the luxury of the Empire or American-style simplicity,” he added in the same speech). The fact that the highest US civil servants at the time were paid much less than in France was also noted by Tocqueville, who saw it as a sure sign that the democratic spirit prevailed in the United States. Despite many ups and downs, this handful of very high salaries persisted in France until World War I (and thus to the fall of the rentier). On these evolutions, see the online technical appendix.
47. See Piketty, *Les hauts revenus en France*, 530.

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48. This argument sets aside the logic of need in favor of a logic of disproportion and conspicuous consumption. Thorstein Veblen said much the same thing in *The Theory of the Leisure Class* (New York: Macmillan, 1899): the egalitarian US dream was already a distant memory.
49. Michèle Lamont, *Money, Morals and Manners: The Culture of the French and the American Upper-Middle Class* (Chicago: University of Chicago Press, 1992). The individuals Lamont interviewed were no doubt closer to the ninetieth or ninety-fifth percentile of the income hierarchy (or in some cases the ninety-eighth or ninety-ninth percentile) than to the sixtieth or seventieth percentile. See also J. Naudet, *Entrer dans l'élite: Parcours de réussite en France, aux États-Unis et en Inde* (Paris: Presses Universitaires de France, 2012).
50. In order to avoid painting too dark a picture, Figures 11.9–11 show only the results for the central scenario. The results for the alternative scenario are even more worrisome and are available online (Supplemental Figures S11.9–11). The evolution of the tax system explains why the share of inheritance in total resources may exceed its nineteenth-century level even if the inheritance flow as a proportion of national income does not. Labor incomes are taxed today at a substantial level (30 percent on average, excluding retirement and unemployment insurance contributions), whereas the average effective tax rate on inheritances is less than 5 percent (even though inheritance gives rise to the same rights as labor income in regard to access to transfers in kind—education, health, security, etc.—which are financed by taxes). The tax issues are examined in Part Four.
51. The same is true of the landed estates worth 30,000 pounds of which Jane Austen speaks in a world where the average per capita income was around 30 pounds a year.
52. A fortune hidden in the Bahamas also figures in season 4 of *Desperate Housewives* (Carlos Solis has to get back his \$10 million, which leads to endless complications with his wife), even though the show is as saccharine as could be and not out to portray social inequalities in a worrisome light, unless, of course, it is a matter of cunning ecological terrorists who threaten the established order or mentally handicapped minorities engaged in a conspiracy.
53. I will come back to this point in Chapter 13.
54. If the alternative scenario is correct, this proportion may exceed 25 percent. See Supplemental Figure S11.11, available online.
55. Compared with the socioeconomic theories of Modigliani, Becker, and Parsons, Durkheim's theory, formulated in *De la division du travail social* (1893), is primarily a political theory of the end of inheritance. Its prediction has proved no more accurate than those of the other theories, but it may be that the wars of the twentieth century merely postponed the problem to the twenty-first.
56. Mario Draghi, *Le Monde*, July 22, 2012.
57. I do not mean to underestimate the importance of the taxi problem. But I would not venture to suggest that this is the foremost problem faced by Europe or global capitalism in the twenty-first century.

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58. In France, fewer than 1 percent of adult males had the right to vote under the Restoration (90,000 voters out of 10 million); this proportion rose to 2 percent under the July Monarchy. Property requirements for holding office were even stricter: fewer than 0.2 percent of adult males met them. Universal male suffrage, briefly introduced in 1793, became the norm after 1848. Less than 2 percent of the British population could vote until 1831. Subsequent reforms in 1831 and especially 1867, 1884, and 1918 gradually put an end to property qualifications.
59. The German data presented here were collected by Christoph Schinke, “Inheritance in Germany 1911 to 2009: A Mortality Multiplier Approach,” Master’s thesis, Paris School of Economics, 2012. See the online technical appendix.
60. The British flows seem to have been slightly smaller (20–21 percent rather than 23–24 percent). Note, however, that this is based on an estimate of the fiscal flow and not the economic flow and is therefore likely to be slightly too low. The British data were collected by Anthony Atkinson, “Wealth and Inheritance in Britain from 1896 to the Present,” London School of Economics, 2012.
61. If this were to happen at the global level, the global return on capital might decrease, and greater life-cycle wealth might in part supplant transmissible wealth (because a lower return on capital discourages the second type of accumulation more than the first, which is not certain). I will come back to these questions in Chapter 12.
62. On this subject see the remarkable book by Anne Gotman, *Dilapidation et prodigalité* (Paris: Nathan, 1995), based on interviews with individuals who squandered large fortunes.
63. In particular, Modigliani quite simply failed to include capitalized incomes in inherited wealth. Kotlikoff and Summers, for their part, did take these into account without limit (even if the capitalized inheritance exceeded the wealth of the heir), which is also incorrect. See the online technical appendix for a detailed analysis of these questions.

12. Global Inequality of Wealth in the Twenty-First Century

1. Recall that global GDP, using purchasing power parity, was roughly \$85 trillion (70 million euros) in 2012–2013, and according to my estimates total private wealth (real estate, business, and financial assets, net of liabilities) was around four years of global GDP, or about \$340 trillion (280 million euros). See Chapters 1 and 6 and the online technical appendix.
2. Inflation in this period averaged 2–2.5 percent a year (and was somewhat lower in euros than in dollars; see Chapter 1). All the detailed series are available in the online technical appendix.
3. If one calculates these averages with respect to the total world population (including children as well as adults), which grew considerably less than the adult population in the period 1987–2013 (1.3 percent a year compared with 1.9 percent), all the growth rates increase, but the differences between them do not change. See Chapter 1 and the online technical appendix.

4. See the online technical appendix, Supplemental Table S12.1, available online.
5. For example, if we assume that the rate of divergence observed between 1987 and 2013 at the level of the top twenty-millionth will continue to apply in the future to the fractile consisting of the 1,400 billionaires included in the 2013 ranking (roughly the top three-millionths), the share of this fractile will increase from 1.5 percent of total global wealth in 2013 to 7.2 percent in 2050 and 59.6 percent in 2100.
6. The national wealth rankings published by other magazines in the United States, France, Britain, and Germany reach a little lower in the wealth hierarchy than *Forbes's* global ranking, and the share of wealth covered in some cases is as high as 2 or 3 percent of the country's total private wealth. See the online technical appendix.
7. In the media, the wealth of billionaires is sometimes expressed as a proportion of the annual flow of global output (or of the GDP of some country, which gives frightening results). This makes more sense than to express these large fortunes as a proportion of the global capital stock.
8. These reports rely in particular on the innovative work of James B. Davies, Susanna Sandström, Anthony Shorrocks, and Edward N. Wolff, "The Level and Distribution of Global Household Wealth," *Economic Journal* 121, no. 551 (March 2011): 223–54, and on data of the type presented in Chapter 10. See the online technical appendix.
9. Generally speaking, the sources used to estimate wealth distributions (separately for each country) pertain to years some distance in the past, updated almost exclusively with aggregate data taken from national accounts and similar sources. See the online technical appendix.
10. For example, the French media, accustomed for years to describing a massive flight of large fortunes from France (without really trying to verify the information other than by anecdote), have been astonished to learn every fall since 2010 from the *Crédit Suisse* reports that France is apparently the European wealth leader: the country is systematically ranked number 3 worldwide (behind the United States and Japan and well ahead of Britain and Germany) in number of millionaire residents. In this case, the information seems to be correct (as far as it is possible to judge from available sources), even if the bank's methods tend to exaggerate the difference between France and Germany. See the online technical appendix.
11. See the online technical appendix.
12. In terms of the global income distribution, it seems that the sharp increase in the share of the top centile (which is not happening in all countries) has not prevented a decrease in the global Gini coefficient (although there are large uncertainties in the measurement of inequality in certain countries, especially China). Since the global wealth distribution is much more concentrated at the top of the distribution, it is quite possible that the increase in the share of the top centiles matters more. See the online technical appendix.

13. The average fortune of the top ten-thousandth (450 adults out of 45 billion) is about 50 million euros, or nearly 1,000 times the global average wealth per adult, and their share of total global wealth is about 10 percent.
14. Bill Gates was number one in the *Forbes* rankings from 1995 to 2007, before losing out to Warren Buffet in 2008–2009 and then to Carlos Slim in 2010–2013.
15. The first dyes invented in 1907 were named “L’Auréale,” after a hair style in vogue at the time and reminiscent of an aureole. Their invention led to the creation in 1909 of the French Company for Harmless Hair Dyes, which eventually, after the creation of many other brands (such as Monsavon in 1920) became L’Oréal in 1936. The similarity to the career of César Birotteau, whom Balzac depicts as having made his fortune by inventing “L’Eau Carminative” and “La Pâte des Sultanes” in the early nineteenth century, is striking.
16. With a capital of 10 billion euros, a mere 0.1 percent is enough to finance annual consumption of 10 million euros. If the return on capital is 5 percent, 98 percent of it can be saved. If the return is 10 percent, 99 percent can be saved. In any case, consumption is insignificant.
17. Honoré de Balzac, *Le père Goriot* (Paris: Livre de Poche, 1983), 105–109.
18. In the case of *Challenges*, there seem to be too few fortunes in the 50–500 million euro range compared with the number of wealth tax declarations in the corresponding brackets (especially since a large part of business capital is not taxable under the wealth tax and therefore does not appear in the statistics). This may be because *Challenges* does not look at diversified fortunes. Indeed, both sources underestimate the actual number of large fortunes for opposite reasons: the *Challenges* source overvalues business capital, while the fiscal source underestimates it, and both rely on vague and shifting definitions. Citizens are left perplexed and made to feel that the subject of wealth is quite opaque. See the online technical appendix.
19. Conceptually, moreover, it is no simple matter to define what a normal return on inherited wealth might be. In Chapter 11, I applied the same average return on capital to all fortunes, which no doubt leads to treating Liliane Bettencourt as a very partial heir (in view of the very high return on her capital), more partial than Steve Forbes himself, who nevertheless classifies her as a pure heiress, even though he counts himself among the “nurturers” of inherited wealth. See the online technical appendix.
20. For some particularly strong assertions about the relative merits of Slim and Gates, unfortunately without any precise factual basis, see, for example, Daron Acemoglu and James A. Robinson, *Why Nations Fail: The Origins of Power, Prosperity, and Poverty* (New York: Crown Publishing, 2012), 34–41. The authors’ harsh tone is all the more surprising in that they do not really discuss the ideal distribution of wealth. The book is built around a defense of the role of systems of property rights stemming from the British, American, and French revolutions in the development process (and little is said about more recent social institutions or systems of taxation).

21. See, for example, the magazine *Capital*, no. 255, December 3, 2012: “180 million euros . . . a sum that pales in comparison to the value of the real estate that the head of the firm, Lakshmi Mittal, recently acquired in London for three times that amount. Indeed, the businessman recently purchased the former embassy of the Philippines (for 70 million pounds, or 86 million euros), supposedly for his daughter Vanisha. A short while earlier, his son Aditya was the recipient of the generous gift of a home worth 117 million pounds (144 million euros). The two properties are located on Kensington Palace Gardens, known as Billionaires’ Row, not far from the paternal palace. Lakshmi Mittal’s residence is said to be the ‘most expensive private home in the world’ and is equipped with a Turkish bath, a jewel-encrusted swimming pool, marble from the same quarry as the Taj Mahal, and servants’ quarters. . . . All told, these three homes cost 542 million euros, or 3 times the 180 million invested in Florange.”
22. The *Forbes* ranking uses an interesting criterion, but one that is hard to apply in any precise way: it excludes “despots” and indeed anyone whose fortune depends on “their political position” (like the Queen of England). But if an individual acquires his fortune before coming to power, he remains in the ranking: for example, the Georgia oligarch Bidzina Ivanishvili is still in the 2013 list, although he became prime minister in late 2012. He is credited with a fortune of \$5 billion, or one-quarter of his country’s GDP (between 5 percent and 10 percent of Georgia’s national wealth).
23. The total capital endowment of US universities is about 3 percent of GDP, and the annual income on this capital is about 0.2 percent of GDP, which is a little over 10 percent of total US expenditure on higher education. But this share is as high as 30 or 40 percent of the resources of the most richly endowed universities. Furthermore, these capital endowments play a role in the governance of these institutions that often outweighs their monetary importance. See the online technical appendix.
24. The data used here come mainly from reports published by the National Association of College and University Business Officers, as well as from financial reports published by Harvard University, Yale University, Princeton University, and other institutions. See the online technical appendix.
25. For results by subperiod, see the online technical appendix, Supplemental Table S12.2, available online.
26. Note, however, that the main difference arises from the fact that most owners of private wealth must pay significant taxes: the average real return before taxes was around 5 percent in the United States in 1980–2010. See the online technical appendix.
27. The numbers of universities in each category indicated in parentheses in Table 12.2 are based on 2010 endowments, but so as not to bias the results, the returns were calculated by ranking universities according to their endowment at the beginning of each decade. All the detailed results are available in the online technical appendix. See in particular Supplemental Table S12.2, available online.

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28. Real estate can be a very high yield investment if one identifies the right projects around the world. In practice, these include business and commercial as well as residential properties, often on a very large scale.
29. This is confirmed by the fact that relative rankings do not change much over the thirty-year period 1980–2010. The hierarchy of university endowments remains more or less the same.
30. To take Harvard University as an example, annual financial reports show that the endowment yielded an average real return of about 10 percent from 1990 to 2010, whereas new gifts added an average of about 2 percent a year to the endowment. Thus the total real income (from return on the endowment plus gifts) amounted to 12 percent of the endowment; a portion of this, amounting to 5 percent of the endowment, was used to pay current university expenses, while the other 7 percent was added to the endowment. This enabled the endowment to increase from \$5 billion in 1990 to nearly \$30 billion in 2010 while allowing the university to consume an annual flow of resources 2.5 times as great as it received in gifts.
31. Note, however, that the historic rebound of asset prices appears to add no more than a point of additional annual return, which is fairly small compared with the level of return I have been discussing. See the online technical appendix.
32. For example, because Bill Gates maintains effective control over the assets of the Bill and Melinda Gates Foundation, *Forbes* chooses to count those assets as part of Gates’s personal fortune. Maintaining control seems incompatible with the idea of a disinterested gift.
33. According to Bernard Arnault, the principal stockholder in LVMH, the world leader in luxury goods, the purpose of the Belgian foundation that holds his assets is neither charitable nor fiscal. Rather, it is primarily an estate vehicle. “Among my five children and two nephews, there is surely one who will prove capable of taking over after I am gone,” he remarked. But he is afraid of disputes. By placing his assets in the foundation, he forces his heirs to vote “indissociably,” which “ensures the survival of the group if I should die and my heirs should be unable to agree.” See *Le Monde*, April 11, 2013.
34. The work of Gabrielle Fack and Camille Landais, which is based on these types of reforms in the United States and France, speaks eloquently to this point. See the online technical appendix.
35. For an incomplete estimate for the United States, see the online technical appendix.
36. See Chapter 5.
37. It was even worse in the nineteenth century, at least in the city, and especially in Paris, where before World War I most buildings were not chopped up into apartments. One therefore needed to be wealthy enough to buy an entire building.
38. See Chapter 5.
39. The nominal average return for 1998–2012 was only 5 percent a year. It is difficult to compare these returns with those on university endowments, however, in part because the period 1998–2012 was not as good as 1990–2010 or 1980–2010 (and unfortunately the Norwegian fund’s statistics go back only as far as 1998), and

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because this relatively low return was due in part to appreciation of the Norwegian krone.

40. According to the census of 2010, the United Arab Emirates (of which Abu Dhabi is the largest member state) have a native population of a little over 1 million (plus 7 million foreign workers). The native population of Kuwait is about the same size. Qatar has about 300,000 nationals and 1.5 million foreigners. Saudi Arabia alone employs nearly 10 million foreign workers (in addition to its native population of nearly 20 million).
41. See the online technical appendix.
42. One should also take into account public nonfinancial assets (public buildings, school, hospitals, etc.) as well as financial assets not formally included in sovereign wealth funds, and then subtract public debts. Net public wealth is currently less than 3 percent of private wealth in the rich countries, on average (in some cases net public wealth is negative), so this does not make much difference. See Chapters 3–5 and the online technical appendix.
43. If we exclude real estate and unlisted business assets, financial assets in the narrow sense represented between a quarter and a third of global private wealth in 2010, that is, between a year and a year and a half of global GDP (and not four years). The sovereign wealth funds thus own 5 percent of global financial assets. Here I refer to net financial assets owned by households and governments. In view of the very substantial cross-holdings of financial and nonfinancial corporations within and between countries, gross financial assets amount to much more than three years of global GDP. See the online technical appendix.
44. The rent on natural resources had already exceeded 5 percent of global GDP from the mid-1970s to the mid-1980s. See the online technical appendix.
45. My hypotheses implicitly include the long-run savings rate in China (and elsewhere), counting both public and private saving. We cannot predict the future relationship between public property (notably in sovereign wealth funds) and private property in China.
46. In any case, this transparent process of rent transformation (from oil rent to a diversified capital rent) illustrates the following point: capital has historically taken a variety of forms (land, oil, financial assets, business capital, real estate, etc.), but its underlying logic has not really changed, or at any rate has changed much less than people sometimes think.
47. In a pay-as-you-go, the contributions to the pension fund by active workers are directly paid out to retirees without being invested. On these issues, see Chapter 13.
48. Between one-quarter and one-half of European and US capital (or even more, depending on various assumptions). See the online technical appendix.
49. The divergence of the petroleum exporters can be seen as an oligarchic divergence, moreover, because petroleum rents go to a small number of individuals, who may be able to sustain a high level of accumulation through sovereign wealth funds.
50. The GDP of the European Union was close to 15 trillion euros in 2012–2013, compared with 10 trillion euros for China’s GDP at purchasing power parity (or 6 trillion

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at current exchange rates, which may be better for comparing international financial assets). See Chapter 1. China's net foreign assets are growing rapidly, but not fast enough to overtake the total private wealth of the rich countries. See the online technical appendix.

51. See Aurélie Sotura, “Les étrangers font-ils monter les prix de l’immobilier? Estimation à partir de la base de la chambre des Notaires de Paris, 1993–2008,” Paris, Ecoles des Hautes Etudes en Sciences Social and Paris School of Economics, 2011.
52. See in particular Figure 5.7.
53. In Figure 12.6, the “wealthy countries” include Japan, Western Europe, and the United States. Adding Canada and Oceania would change little. See the online technical appendix.
54. See Chapters 3–5.
55. Or 7–8 percent of total net financial assets worldwide (see above).
56. See the online technical appendix for a discussion of the high estimate made in 2012 by James Henry for the Tax Justice Network, and the intermediate 2010 estimate by Ronen Palan, Richard Murphy, and Christian Chavagneux.
57. The data in Figure 12.6 are from Gabriel Zucman, “The Missing Wealth of Nations: Are Europe and the U.S. Net Debtors or Net Creditors?,” *Quarterly Journal of Economics* 128, no. 3 (2013): 1321–64.
58. According to an estimate by Roine and Waldenström, accounting for assets held abroad (estimated from inconsistencies in the Swedish balance of payments) can, under certain assumptions, lead to the conclusion that the top centile in Sweden is close to the same level of wealth as the top centile in the United States (which probably should also be increased). See the online technical appendix.

13. *A Social State for the Twenty-First Century*

1. As is customary, I take tax revenues to include all taxes, fees, social contributions, and other payments that citizens must pay under penalty of law. The distinctions between different types of payments, especially taxes and social insurance contributions, are not always very clear and do not mean the same thing in different countries. For the purpose of historical and international comparisons, it is important to consider all sums paid to the government, whether the central government or states or cities or other public agencies (such as social security, etc.). To simplify the discussion, I will sometimes use the word “taxes,” but unless otherwise indicated I always include other compulsory charges as well. See the online technical appendix.
2. Military expenditures generally amount to at least 2–3 percent of national income and can go much higher in a country that is unusually active militarily (like the United States, which currently devotes more than 4 percent of its national income to the military) or that feels its security and property threatened (Saudi Arabia and the Gulf states spend more than 10 percent of national income on the military).
3. Health and education budgets were generally below 1–2 percent of national income in the nineteenth century. For a historical view of the slow development of

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- social spending since the eighteenth century and the acceleration in the twentieth century, see P. Lindert, *Growing Public: Social Spending and Economic Growth since the Eighteenth Century* (Cambridge: Cambridge University Press, 2004).
4. Note that the share of compulsory payments is expressed here as a proportion of national income (which is generally around 90 percent of GDP after deduction of about 10 percent for depreciation of capital). This seems to me the right thing to do, in that depreciation is not anyone's income (see Chapter 1). If payments are expressed as a percentage of GDP, then the shares obtained are by definition 10 percent smaller (for example, 45 percent of GDP instead of 50 percent of national income).
 5. Gaps of a few points may be due to purely statistical differences, but gaps of 5–10 points are real and substantial indicators of the role played by the government in each country.
 6. In Britain, taxes fell by several points in the 1980s, which marked the Thatcherite phase of government disengagement, but then climbed again in 1990–2000, as new governments reinvested in public services. In France, the state share rose somewhat later than elsewhere, continued to rise strongly in 1970–1980, and did not begin to stabilize until 1985–1990. See the online technical appendix.
 7. In order to focus on long-term trends, I have once again used decennial averages. The annual series of tax rates often include all sorts of minor cyclical variations, which are transitory and not very significant. See the online technical appendix.
 8. Japan is slightly above the United States (32–33 percent of national income). Canada, Australia, and New Zealand are closer to Britain (35–40 percent).
 9. The term “social state” captures the nature and variety of the state's missions better than the more restrictive term “welfare state,” in my view.
 10. See Supplemental Table S13.2, available online, for a complete breakdown of public spending in France, Germany, Britain, and the United States in 2000–2010.
 11. Typically 5–6 percent for education and 8–9 percent for health. See the online technical appendix.
 12. The National Health Service, established in 1948, is such an integral part of British national identity that its creation was dramatized in the opening ceremonies of the 2012 Olympic games, along with the Industrial Revolution and the rock groups of the 1960s.
 13. If one adds the cost of private insurance, the US health care system is by far the most expensive in the world (nearly 20 percent of national income, compared with 10–12 percent in Europe), even though a large part of the population is not covered and health indicators are not as good as in Europe. There is no doubt that universal public health insurance systems, in spite of their defects, offer a better cost-benefit ratio than the US system.
 14. By contrast, social spending on education and health reduces the (monetary) disposable income of households, which explains why the amount of the latter decreased from 90 percent of national income at the turn of the twentieth century to 70–80 percent today. See Chapter 5.

15. Pensions systems with capped payments are usually called, after the architect of Britain’s social state, “Beveridgian” (with the extreme case a flat pension amount for everyone, as in Britain), in contrast to “Bismarckian,” “Scandinavian,” or “Latin” systems, in which pensions are almost proportional to wages for the vast majority of the population (nearly everyone in France, where the ceiling is exceptionally high: eight times the average wage, compared with two to three times in most countries).
16. In France, which stands out for the extreme complexity of its social benefits and the proliferation of rules and agencies, fewer than half of the people who were supposed to benefit from one welfare-to-work program (the so-called active solidarity income, a supplement to very low part-time wages) applied for it.
17. One important difference between Europe and the United States is that income support programs in the United States have always been reserved for people with children. For childless individuals, the carceral state sometimes does the job of the welfare state (especially for young black males). About 1 percent of the adult US population was behind bars in 2013. This is the highest rate of incarceration in the world (slightly ahead of Russia and far ahead of China). The incarceration rate is more than 5 percent for adult black males (of all ages). See the online technical appendix. Another US peculiarity is the use of food stamps (whose purpose is to ensure that welfare recipients spend their benefits on food rather than on drink or other vices), which is inconsistent with the liberal worldview often attributed to US citizens. It is a sign of US prejudices in regard to the poor, which seem to be more extreme than European prejudices, perhaps because they are reinforced by racial prejudices.
18. With variations between countries described above.
19. “We hold these truths to be self-evident, that all men are created equal, that they are endowed by their Creator with certain inalienable Rights, that among these are Life, Liberty and the pursuit of Happiness; that to secure these rights, Governments are instituted among Men, deriving their just powers from the consent of the governed.”
20. The notion of “common utility” has been the subject of endless debate, and to examine this would go far beyond the framework of this book. What is certain is that the drafters of the 1789 Declaration did not share the utilitarian spirit that has animated any number of economists since John Stuart Mill: a mathematical sum of individual utilities (together with the assumption that the utility function is “concave,” meaning that its rate of increase decreases with increasing income, so that redistribution of income from the rich to the poor increases total utility). This mathematical representation of the desirability of redistribution bears little apparent relation to the way most people think about the question. The idea of rights seems more pertinent.
21. It seems reasonable to define “the most disadvantaged” as those individuals who have to cope with the most unfavorable factors beyond their control. To the extent that inequality of conditions is due, at least in part, to factors beyond the control of individuals, such as the existence of unequal family endowments (in

terms of inheritances, cultural capital, etc.) or good fortune (special talents, luck, etc.), it is just for government to seek to reduce these inequalities as much as possible. The boundary between equalization of opportunities and conditions is often rather porous (education, health, and income are both opportunities and conditions). The Rawlsian notion of fundamental goods is a way of moving beyond this artificial opposition.

22. “Social and economic inequalities . . . are just only if they result in compensating benefits for everyone, and in particular for the least advantaged members of society” (John Rawls, *A Theory of Justice* [Cambridge, MA: Belknap Press, 15]). This 1971 formulation was repeated in *Political Liberalism*, published in 1993.
23. These theoretical approaches have recently been extended by Marc Fleurbaey and John Roemer, with some tentative empirical applications. See the online technical appendix.
24. Despite the consensus in Europe there is still considerable variation. The wealthiest and most productive countries have the highest taxes (50–60 percent of the national income in Sweden and Denmark), and the poorest, least developed countries have the lowest taxes (barely 30 percent of national income in Bulgaria and Romania). See the online appendix. In the United States there is less of a consensus. Certain substantial minority factions radically challenge the legitimacy of all federal social programs or indeed of social programs of any kind. Once again, racial prejudice seems to have something to do with this (as exemplified by the debates over the health care reform adopted by the Obama administration).
25. In the United States and Britain, the social state also grew rapidly even though economic growth was significantly lower, which may have fostered a powerful sense of loss reinforced by a belief that other countries were catching up, as discussed earlier (see Chapter 2 in particular).
26. According to the work of Anders Bjorklund and Arnaud Lefranc on Sweden and France, respectively, it seems that the intergenerational correlation decreased slightly for cohorts born in 1940–1950 compared with those born in 1920–1930, then increased again for cohorts born in 1960–1970. See the online technical appendix.
27. It is possible to measure mobility for cohorts born in the twentieth century (with uneven precision and imperfect comparability across countries), but it is almost impossible to measure intergenerational mobility in the nineteenth century except in terms of inheritance (see Chapter 11). But this is a different issue from skill and earned income mobility, which is what is of interest here and is the focal point of these measurements of intergenerational mobility. The data used in these works do not allow us to isolate mobility of capital income.
28. The correlation coefficient ranges from 0.2–0.3 in Sweden and Finland to 0.5–0.6 in the United States. Britain (0.4–0.5) is closer to the United States but not so far from Germany or France (0.4). Concerning international comparisons of intergenerational correlation coefficients of earned income (which are also confirmed by twin studies), see the work of Markus Jantti. See the online technical appendix.

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29. The cost of an undergraduate year at Harvard in 2012–2013 was \$54,000, including room and board and various other fees (tuition in the strict sense was \$38,000). Some other universities are even more expensive than Harvard, which enjoys a high income on its endowment (see Chapter 12).
30. See G. Duncan and R. Murnane, *Whither Opportunity? Rising Inequality, Schools, and Children's Life Chances* (New York: Russell Sage Foundation, 2011), esp. chap. 6. See the online technical appendix.
31. See Jonathan Meer and Harvey S. Rosen, "Altruism and the Child Cycle of Alumni Donations," *American Economic Journal: Economic Policy* 1, no. 1 (2009): 258–86.
32. This does not mean that Harvard recruits its students exclusively from among the wealthiest 2 percent of the nation. It simply means that recruitment below that level is sufficiently rare, and that recruitment among the wealthiest 2 percent is sufficiently frequent, that the average is what it is. See the online technical appendix.
33. Statistics as basic as the average income or wealth of parents of students at various US universities are very difficult to obtain and not much studied.
34. The highest tuition fee British universities may charge was increased to £1,000 in 1998, £3,000 in 2004, and £9,000 in 2012. The share of tuition fees in total resources of British universities in 2010 is almost as high as in the 1920s and close to the US level. See the interesting series of historical studies by Vincent Carpentier, "Public-Private Substitution in Higher Education," *Higher Education Quarterly* 66, no. 4 (October 2012): 363–90.
35. Bavaria and Lower Saxony decided in early 2013 to eliminate the university tuition of 500 euros per semester and offer free higher education like the rest of Germany. In the Nordic countries, tuition is never more than a few hundred euros, as in France.
36. One finds the same redistribution from bottom to top in primary and secondary education: students at the most disadvantaged schools and high schools are assigned the least experienced and least trained teachers and therefore receive less public money per child than students at more advantaged schools and high schools. This is all the more regrettable because a better distribution of resources at the primary level would greatly reduce inequalities of educational opportunity. See Thomas Piketty and M. Valdenaire, *L'impact de la taille des classes sur la réussite scolaire dans les écoles, collèges et lycées français* (Paris: Ministère de l'Éducation Nationale, 2006).
37. As in the case of Harvard, this average income does not mean that Sciences Po recruits solely among the wealthiest 10 percent of families. See the online technical appendix for the complete income distribution of parents of Sciences Po students in 2011–2012.
38. According to the well-known Shanghai rankings, 53 of the 100 best universities in the world in 2012–2013 were in the United States, compared with 31 in Europe (9 of which were in Britain). The order is reversed, however, when we look at the 500 best universities (150 for the United States and 202 for Europe, of which 38 are in Britain). This reflects significant inequalities among the 800 US universities (see Chapter 12).
39. Note, however, that compared with other expenses (such as pensions), it would be relatively easy to raise spending on higher education from the lowest levels (barely

- 1 percent of national income in France) to the highest (2–3 percent in Sweden and the United States).
40. For example, tuition at Sciences Po currently ranges from zero for parents with the least income to 10,000 euros a year for parents with incomes above 200,000 euros. This system is useful for producing data on parental income (which unfortunately has been little studied). Compared with Scandinavian-style public financing, however, such a system amounts to a privatization of the progressive income tax: the additional sums paid by wealthy parents go to their own children and not to the children of other people. This is evidently in their own interest, not in the public interest.
 41. Australia and Britain offer “income-contingent loans” to students of modest background. These are not repaid until the graduates achieve a certain level of income. This is tantamount to a supplementary income tax on students of modest background, while students from wealthier backgrounds received (usually untaxed) gifts from their parents.
 42. Emile Boutmy, *Quelques idées sur la création d’une Faculté libre d’enseignement supérieur* (Paris, 1871). See also P. Favre, “Les sciences d’Etat entre déterminisme et libéralisme: Emile Boutmy (1835–1906) et la création de l’Ecole libre des sciences politiques,” *Revue française de sociologie* 22 (1981).
 43. For an analysis and defense of the “multi-solidarity” model, see André Masson, *Des liens et des transferts entre générations* (Paris: Editions de l’EHESS, 2009).
 44. See Figures 10.9–11.
 45. Recall that this volatility is the reason why PAYGO was introduced after World War II: people who had saved for retirement by investing in financial markets in 1920–1930 found themselves ruined, and no one wished to try the experiment again by imposing a compulsory capitalized pension system of the sort that any number of countries had tried before the war (for example, in France under the laws of 1910 and 1928).
 46. This was largely achieved by the Swedish reform of the 1990s. The Swedish system could be improved and adapted to other countries. See for example Antoine Bozio and Thomas Piketty, *Pour un nouveau système de retraite: Des comptes individuels de cotisations financés par répartition* (Paris: Editions rue d’Ulm, 2008).
 47. It is also possible to imagine a unified retirement scheme that would offer, in addition to a PAYGO plan, an opportunity to earn a guaranteed return on modest savings. As I showed in the previous chapter, it is often quite difficult for people of modest means to achieve the average return on capital (or even just a positive return). In some respects, this what the Swedish system offers in the (small) part that it devotes to capitalized funding.
 48. Here I am summarizing the main results of Julia Cagé and Lucie Gadenne, “The Fiscal Cost of Trade Liberalization,” Harvard University and Paris School of Economics Working Paper no. 2012–27 (see esp. figure 1).
 49. Some of the problems of health and education the poor countries face today are specific to their situation and cannot really be addressed by drawing on the past

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experience of today’s developed countries (think of the problem of AIDS, for example). Hence new experiments, perhaps in the form of randomized controlled trials, may be justified. See, for example, Abhijit Banerjee and Esther Duflo, *Poor Economics* (New York: Public Affairs, 2012). As a general rule, however, I think that development economics tends to neglect actual historical experience, which, in the context of this discussion, means that too little attention is paid to the difficulty of developing an effective social state with paltry tax revenues. One important difficulty is obviously the colonial past (and therefore randomized controlled trials may offer a more neutral terrain).

50. See Thomas Piketty and Nancy Qian, “Income Inequality and Progressive Income Taxation in China and India: 1986–2015,” *American Economic Journal: Applied Economics* 1, no. 2 (April 2009): 53–63. The difference between the two countries is closely related to the greater prevalence of wage labor in China. History shows that the construction of a fiscal and social state and of a wage-earner status often go together.

14. *Rethinking the Progressive Income Tax*

1. The British economist Nicholas Kaldor proposed such a tax, and I say more about it later, but for Kaldor it was a complement to progressive income and estate taxes, in order to ensure that they were not circumvented. It was not meant as a substitute for these taxes, as some have argued.
2. For example, in 1990, when some social contributions in France were extended to revenue streams other than employment income (including capital income and retiree income) to create what was called the “generalized social contribution,” (*contribution sociale généralisée*, or CSG), the corresponding receipts were reclassified as an income tax under international norms.
3. The poll tax, which was adopted in 1988 and abolished in 1991, was a local tax that required the same payment of every adult no matter what his or her income or wealth might be, so its rate was lower for the rich.
4. See Camille Landais, Thomas Piketty, and Emmanuel Saez, *Pour une révolution fiscale: Un impôt sur le revenu pour le 21^e siècle* (Paris: Le Seuil, 2010), pp. 48–53. Also available at www.revolution-fiscale.fr.
5. In particular, the estimate fails to account for income hidden in tax havens (which, as indicated in Chapter 12, is quite a lot) and assumes that “tax shelters” are equally common at all levels of income and wealth (which probably leads to an overestimate of the real rate of taxation at the top of the hierarchy). Note, too, that the French tax system is exceptionally complex, with many special categories and overlapping taxes. (For example, France is the only developed country that does not withhold income tax at the source, even though social contributions have always been withheld at the source.) This complexity makes the system even more regressive and difficult to understand (just as the pension system is difficult to understand).

6. Only income from inherited capital is taxed under the progressive income tax (along with other capital income) and not inherited capital itself.
7. In France, for example, the average tax on estates and gifts is barely 5 percent; even for the top centile of inheritances, it is just 20 percent. See the online technical appendix.
8. See Figures 11.9–11 and the online technical appendix.
9. For example, instead of taxing the bottom 50 percent at a rate of 40–45 percent and the next 40 percent at a rate of 45–50 percent, one could tax the bottom group at 30–35 percent and the second group at 50–55 percent.
10. Given the low rate of intergenerational mobility, this would also be more just (in terms of the criteria of justice discussed in Chapter 13). See the online technical appendix.
11. The “general tax on income” (impôt général sur le revenu, or IGR) this law created is a progressive tax on total income. It was the forerunner of today’s income tax. It was modified by the law of July 31, 1917, creating what was called the *cédulaire* tax (which taxed different categories of income, such as corporate profits and wages, differently). This law was the forerunner of today’s corporate income tax. For details of the turbulent history of the income tax in France since the fundamental reforms of 1914–1917, see Thomas Piketty, *Les hauts revenus en France au 20e siècle: Inégalités et redistribution 1901–1908* (Paris: Grasset, 2001), 233–334.
12. The progressive income tax was aimed primarily at top capital incomes (which everyone at the time knew dominated the income hierarchy), and it never would have occurred to anyone in any country to grant special exemptions to capital income.
13. For example, the many works the US economist Edwin Seligman published between 1890 and 1910 in praise of the progressive income tax were translated into many languages and stirred passionate debate. On this period and these debates, see Pierre Rosanvallon, *La société des égaux* (Paris: Le Seuil, 2011), 227–233. See also Nicolas Delalande, *Les batailles de l’impôt: Consentement et résistances de 1789 à nos jours* (Paris: Le Seuil, 2011).
14. The top tax rate is generally a “marginal” rate, in the sense that it applies only to the “margin,” or portion of income above a certain threshold. The top rate generally applies to less than 1 percent of the population (in some cases less than 0.1 percent). To have a comprehensive view of progressivity, it is better to look at the effective rates paid by different centiles of the income distribution (which can be much lower). The evolution of the top rate is nevertheless interesting, and by definition it gives an upper bound on the effective rate paid by the wealthiest individuals.
15. The top tax rates shown in Figure 14.1 do not include the increases of 25 percent introduced in 1920 for unmarried taxpayers without children and married taxpayers “who after two years of marriage still have no child.” (If we included them, the top rate would be 62 percent in 1920 and 90 percent in 1925.) This interesting provision of the law, which attests to the French obsession with the birthrate as well as to the limitless imagination of legislators when it comes to expressing a

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country's hopes and fears through the tax rate, would later be rebaptized, from 1939 to 1944, the “family compensation tax,” which was extended from 1945 to 1951 through the family quotient system (under which married couples without a child, normally endowed with 2 shares, were decreased to 1.5 shares if they still had no child “after three years of marriage”). Note that the Constituent Assembly of 1945 increased by one year the grace period set in 1920 by the National Bloc. See *Les hauts revenus en France*, 233–334.

16. A progressive tax on total income had earlier been tried in Britain between the Napoleonic wars, as well as in the United States during the Civil War, but in both cases the taxes were repealed shortly after hostilities ended.
17. See Mirelle Touzery, *L'invention de l'impôt sur le revenu: La taille tarifée 1715–1789* (Paris: Comité pour l'histoire économique et financière, 1994).
18. Business inventory and capital were subject to a separate tax, the *patente*. On the system of the *quatre vieilles* (the four direct taxes, which, along with the estate tax, formed the heart of the tax system created in 1791–1792), see *Les hauts revenus en France*, 234–239.
19. One of the many parliamentary committees to consider a progressive estate tax in the nineteenth century had this to say: “When a son succeeds his father, there is strictly speaking no transmission of property but merely continued enjoyment, according to the authors of the Civil Code. If this doctrine is taken to be absolute, then any tax on direct bequests is ruled out. In any case, extreme moderation in setting the rate of taxation is imperative.” See *ibid.*, 245.
20. A professor at the Ecole Libre des Sciences Politiques and the Collège de France from 1880 to 1916 and outspoken champion of colonization among the conservative economists of the day, Leroy-Beaulieu was also the editor of *L'économiste français*, an influential weekly magazine roughly equivalent to the *Economist* today, especially in its limitless and often undiscerning zeal to defend the powerful interests of its time.
21. For instance, he noted with satisfaction that the number of indigents receiving assistance in France increased by only 40 percent from 1837 to 1860, whereas the number of assistance offices had nearly doubled. Apart from the fact that one would have to be very optimistic to deduce from these figures that the actual number of indigents had decreased (which Leroy-Beaulieu did not hesitate to do), a decrease in the absolute number of the poor in a context of economic growth would obviously tell us nothing about the evolution of income inequality. See *ibid.*, 522–531.
22. At times one has the thought that he might have been responsible for the advertisements that HSBC plastered all over airport walls a few years ago: “We see a world of opportunities. Do you?”
23. Another classic argument of the time was that the “inquisitorial” procedure of requiring taxpayers to declare their income might suit an “authoritarian” country like Germany but would immediately be rejected by a “free people” like the French. See *Les hauts revenus en France*, 481.

24. For instance, Joseph Caillaux, minister of finance at the time: “We have been led to believe and to say that France was a country of small fortunes, of infinitely fragmented and dispersed capital. The statistics with which the new estate tax regime provides us force us to retreat from this position. . . . Gentlemen, I cannot hide from you the fact that these figures have altered some of my preconceived ideas. The fact is that a small number of people possess the bulk of this country’s wealth.” See Joseph Caillaux, *L’impôt sur le revenu* (Paris: Berger, 1910), 530–532.
25. On the German debates, see Jens Beckert, tr. Thomas Dunlap, *Inherited Wealth*, (Princeton: Princeton University Press, 2008), 220–235. The rates shown in Figure 14.2 concern transmissions in the direct line (from parents to children). The rates on other bequests were always higher in France and Germany. In the United States and Britain, rates generally do not depend on the identity of the heir.
26. On the role of war in changing attitudes toward the estate tax, see Kenneth Scheve and David Stasavage, “Democracy, War, and Wealth: Evidence of Two Centuries of Inheritance Taxation,” *American Political Science Review* 106, no. 1 (February 2012): 81–102.
27. To take an extreme example, the Soviet Union never needed a confiscatory tax on excessive incomes or fortunes because its economic systems imposed direct controls on the distribution of primary incomes and almost totally outlawed private property (admittedly in ways that were much less respectful of the law). The Soviet Union did have an income tax at times, but it was relatively insignificant, with very low top rates. The same is true in China. I come back to this in the next chapter.
28. Pace Leroy-Beaulieu, King put France in the same league as Britain and Prussia, which was substantially correct.
29. See Irving Fisher, “Economists in Public Service: Annual Address of the President,” *American Economic Review* 9, no. 1 (March 1919): 5–21. Fisher took his inspiration mainly from the Italian economist Eugenio Rignano. See G. Erreygers and G. Di Bartolomeo, “The Debates on Eugenio Rignano’s Inheritance Tax Proposals,” *History of Political Economy* 39, no. 4 (Winter 2007): 605–38. The idea of taxing wealth that had been accumulated in the previous generation less heavily than older wealth that had been passed down through several generations is very interesting, in the sense that there is a stronger sense of double taxation in the former case than in the latter, even if different generations and therefore different individuals are involved in both cases. It is nevertheless difficult to formalize and implement this idea in practice (because estates often follow complex trajectories), which is probably why it has never been tried.
30. To this federal tax one should also add state income tax (which is generally 5–10 percent).
31. The top Japanese income tax rate rose to 85 percent in 1947–1949, when it was set by the US occupier, and then fell immediately to 55 percent in 1950 after Japan regained its fiscal sovereignty. See the online technical appendix.
32. These rates applied in the direct line of inheritance. The rates applied to brothers, sisters, cousins, and nonrelatives were sometimes higher in France and Germany.

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In France today, for example, the rate for bequests to nonrelatives is 60 percent. But rates never reached the 70–80 percent levels applied to children in the United States and Britain.

33. The record level of 98 percent was in force in Britain from 1941 to 1952 and again from 1974 to 1978. See the online technical appendix for the complete series. During the 1972 US presidential campaign, George McGovern, the Democratic candidate, went so far as to propose a top rate of 100 percent for the largest inheritances (the rate was then 77 percent) as part of his plan to introduce a guaranteed minimum income. McGovern's crushing defeat by Nixon marked the beginning of the end of the United States' enthusiasm for redistribution. See Beckett, *Inherited Wealth*, 196.
34. For example, when the top rate on capital income in Britain was 98 percent from 1974 to 1978, the top rate on labor income was 83 percent. See Supplemental Figure S14.1, available online.
35. British thinkers such as John Stuart Mill were already reflecting on inheritances in the nineteenth century. The reflection intensified in the interwar years as more sophisticated probate data became available. It continued after the war in the work of James Meade and Anthony Atkinson, which I cited previously. It is also worth mentioning that Nicholas Kaldor's interesting proposal of a progressive tax on consumption (actually on luxury consumption) was directly inspired by his desire to require more of idle rentiers, whom he suspected of evading the progressive taxes on both estates and income through the use of trust funds, unlike university professors such as himself, who paid the income tax as required. See Nicholas Kaldor, *An Expenditure Tax* (London: Allen and Unwin, 1955).
36. See Josiah Wedgwood, *The Economics of Inheritance* (Harmondsworth, England: Pelican Books, 1929; new ed. 1939). Wedgwood meticulously analyzed the various forces at work. For example, he showed that charitable giving was of little consequence. His analysis led him to the conclusion that only a tax could achieve the equalization he desired. He also showed that French estates were nearly as concentrated as British ones in 1910, from which he concluded that egalitarian division of estates, as in France, though desirable, was clearly not enough to bring about social equality.
37. For France, I have included the generalized social contribution or CSG (currently 8 percent) in the income tax, which makes the current top rate 53 percent. See the online technical appendix for the complete series.
38. This is true not only of the United States and Britain (in the first group) and Germany, France, and Japan (in the second group) but also for all of the eighteen OECD countries for which we have data in the WTID that allow us to study the question. See Thomas Piketty, Emmanuel Saez, and Stefanie Stantcheva, "Optimal Taxation of Top Labor Incomes: A Tale of Three Elasticities," *American Economic Journal: Economic Policy*, forthcoming (fig. 3). See also the online technical appendix.
39. See Piketty et al., "Optimal Taxation of Top Labor Incomes," figs. 3 and A1 and table 2. These results, which cover eighteen countries, are also available in the on-

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line technical appendix. This conclusion does not depend on the choice of starting and ending years. In all cases, there is no statistically significant relationship between the decrease in the top marginal tax rate and the rate of growth. In particular, starting in 1980 rather than 1960 or 1970 does not change the results. For growth rates in the wealth countries over the period 1970–2010, see also Table 5.1 here.

40. We can rule out an elasticity of labor supply greater than 0.1–0.2 and justify the optimal marginal income tax rate described below. All the details of the theoretical argument and results are available in Piketty et al., “Optimal Taxation of Top Labor Incomes,” and are summarized in the online technical appendix.
41. It is important to average over fairly long periods (of at least ten to twenty years) to have meaningful growth comparisons. Over shorter periods, growth rates vary for all sorts of reasons, and it is impossible to draw any valid conclusions.
42. The difference in per capita GDP stems from the fact that US citizens work more hours than Europeans. According to standard international data, GDP per hour worked is approximately the same in the United States as in the wealthiest countries of the European continent (but significantly lower in Britain: see the online technical appendix).
43. See in particular Figure 2.3.
44. Per capita GDP in the United States grew at 2.3 percent a year from 1950 to 1970, 2.2 percent between 1970 and 1990, and 1.4 percent from 1990 to 2012. See Figure 2.3.
45. The idea that the United States has innovated for the rest of the world was recently proposed by Daron Acemoglu, James Robinson, and Thierry Verdier, “Can’t We All Be More Like Scandinavians? Asymmetric Growth and Institutions in an Interdependent World,” (MIT Department of Economics Working Paper no. 12–22, August 20, 2012). This is an essentially theoretical article, whose principal factual basis is that the number of patents per capita is higher in the United States than in Europe. This is interesting, but it seems to be at least partly a consequences of distinct legal practices, and in any case it should allow the innovative country to retain significantly higher productivity (or greater national income).
46. See Piketty et al., “Optimal Taxation of Top Labor Incomes,” fig. 5, tables 3–4. The results summarized here are based on detailed data concerning nearly three thousand firms in fourteen countries.
47. Xavier Gabaix and Augustin Landier argued that skyrocketing executive pay is a mechanical consequence of increased firm size (which supposedly increases the productivity of the most “talented” managers). See “Why Has CEO Pay Increased So Much?” *Quarterly Journal of Economics* 123, no. 1 (2008): 49–100. The problem is that this theory is based entirely on the marginal productivity model and cannot explain the large international variations observed in the data (company size increased in similar proportions nearly everywhere, but pay did not). The authors rely solely on US data, which unfortunately limits the possibilities for empirical testing.
48. Many economists defend the idea that greater competition can reduce inequality. See, for example, Raghuram G. Rajan and Luigi Zingales, *Saving Capitalism from*

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- the Capitalists* (New York: Crown Business, 2003), and L. Zingales, *A Capitalism for the People* (New York: Basic Books, 2012), or Acemoglu, Robinson, and Verdier, “Can’t We All Be More Like Scandinavians.” Some sociologists also take this line: see David B. Grusky, “Forum: What to Do about Inequality?” *Boston Review*, March 21, 2012.
49. Contrary to an idea that is often taught but rarely verified, there is no evidence that executives in the period 1950–1980 made up for low pay with compensation in kind, such as private planes, sumptuous offices, etc. On the contrary, all the evidence suggests that such benefits in kind have increased since 1980.
 50. To be precise, 82 percent. See Piketty et al., “Optimal Taxation of Top Labor Incomes,” table 5.
 51. Note that the progressive tax plays two very distinct roles in this theoretical model (as well as in the history of progressive taxation): confiscatory rates (on the order of 80–90 percent on the top 0.5 or 1 percent of the distribution) would end indecent and useless compensation, while high but nonconfiscatory rates (of 50–60 percent on the top 5 or 10 percent) would raise revenues to finance the social state above the revenues coming from the bottom 90 percent of the distribution.
 52. See Jacob Hacker and Paul Pierson, *Winner-Take-All Politics: How Washington Made the Rich Richer—And Turned its Back on the Middle Class* (New York: Simon and Schuster, 2010); K. Schlozman, Sidney Verba, and H. Brady, *The Unevenly Chorus: Unequal Political Voice and the Broken Promise of American Democracy* (Princeton: Princeton University Press, 2012); Timothy Noah, *The Great Divergence* (New York: Bloomsbury Press, 2012).
 53. See Claudia Goldin and Lawrence F. Katz, *The Race between Education and Technology: The Evolution of U.S. Educational Wage Differentials, 1890–2005* (Cambridge, MA: Belknap Press and NBER, 2010), Rebecca M. Blank, *Changing Inequality* (Berkeley: University of California Press, 2011) and Raghuram G. Rajan, *Fault Lines* (Princeton: Princeton University Press, 2010).
 54. The pay of academic economists is driven up by the salaries offered in the private sector, especially the financial sector, for similar skills. See Chapter 8.
 55. For example, by using abstruse theoretical models designed to prove that the richest people should pay zero taxes or even receive subsidies. For a brief bibliography of such models, see the online technical appendix.

15. *A Global Tax on Capital*

1. The additional revenue could be used to reduce existing taxes or to pay for additional services (such as foreign aid or debt reduction; I will have more to say about this later).
2. Every continent has specialized financial institutions that act as central repositories (custodian banks or clearing houses), whose purpose is to record ownership of various types of assets. But the function of these private institutions is to provide a service to the companies issuing the securities in question, not to record all the

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- assets owned by a particular individual. On these institutions, see Gabriel Zucman, “The Missing Wealth of Nations: Are Europe and the U.S. Net Debtors or Net Creditors?” *Quarterly Journal of Economics* 128, no. 3 (2013): 1321–64.
3. For instance, the fall of the Roman Empire ended the imperial tax on land and therefore the land titles and cadastre that went with it. According to Peter Temin, this contributed to economic chaos in the early Middle Ages. See Peter Temin, *The Roman Market Economy* (Princeton: Princeton University Press, 2012), 149–151.
 4. For this reason, it would be useful to institute a low-rate tax on net corporate capital together with a higher-rate tax on private wealth. Governments would then be forced to set accounting standards, a task currently left to associations of private accountants. On this subject, see Nicolas Véron, Matthieu Autrer, and Alfred Galichon, *L’information financière en crise: Comptabilité et capitalisme* (Paris: Odile Jacob, 2004).
 5. Concretely, the authorities do what is called a “hedonic” regression to calculate the market price as a function of various characteristics of the property. Transactional data are available in all developed countries for this purpose (and are used to calculate real estate price indices).
 6. This temptation is a problem in all systems based on self-reporting by taxpayers, such as the wealth tax system in France, where there is always an abnormally large number of reports of wealth just slightly below the taxable threshold. There is clearly a tendency to slightly understate the value of real estate, typically by 10 or 20 percent. A precomputed statement issued by the government would provide an objective figure based on public data and a clear methodology and would thus put an end to such behavior.
 7. Oddly enough, the French government once again turned to this archaic method in 2013 to obtain information about the assets of its own ministers, officially for the purpose of restoring confidence after one of them was caught in a lie about evading taxes on his wealth.
 8. For example, the Channel Islands, Liechtenstein, Monaco, etc.
 9. It is difficult to estimate the extent of such losses, but in a country like Luxembourg or Switzerland they might amount to as much as 10–20 percent of national income, which would have a substantial impact on their standard of living. (The same is true of a financial enclave like the City of London.) In the more exotic tax havens and microstates, the loss might be as high as 50 percent or more of national income, indeed as high as 80–90 percent in territories that function solely as domiciles for fictitious corporations.
 10. Social insurance contributions are a type of income tax (and are included in the income tax in some countries; see Chapter 13).
 11. See in particular Table 12.1.
 12. Recall the classic definition of income in the economic sense, given by the British economist John Hicks: “The income of a person or collectivity is the value of the maximum that could be consumed during the period while remaining as wealthy at the end of the period as at the beginning.”

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13. Even with a return on capital of 2 percent (much lower than the actual return on the Bettencourt fortune in the period 1987–2013), the economic income on 30 billion euros would amount to 600 million euros, not 5 million.
14. In the case of the Bettencourt fortune, the largest in France, there was an additional problem: the family trust was managed by the wife of the minister of the budget, who was also the treasurer of a political party that had received large donations from Bettencourt. Since the same party had reduced the wealth tax by two-thirds during its time in power, the story naturally stirred up a considerable reaction in France. The United States is not the only country where the wealthy wield considerable political influence, as I showed in the previous chapter. Note, too, that the minister of the budget in question was succeeded by another who had to resign when it was revealed that he had a secret bank account in Switzerland. In France, too, the political influence of the wealthy transcends political boundaries.
15. In practice, the Dutch system is not completely satisfactory: many categories of assets are exempt (particularly those held in family trusts), and the assumed return is 4 percent for all assets, which may be too high for some fortunes and too low for others.
16. The most logical approach is to measure this insufficiency on the basis of average rates of return observed for fortunes of each category so as to make the income tax schedule consistent with the capital tax schedule. One might also consider minimum and maximum taxes as a function of capital income. See the online technical appendix.
17. The incentive argument is central to Maurice Allais's tendentious *L'impôt sur le capital et la réforme monétaire* (Paris: Editions Hermann, 1977), in which Allais went so far as to advocate complete elimination of the income tax and all other taxes in favor of a tax on capital. This is an extravagant idea and not very sensible, given the amounts of money involved. On Allais's argument and current extensions of it, see the online technical appendix. Broadly speaking, discussions of a tax on capital often push people into extreme positions (so that they either reject the idea out of hand or embrace it as the one and only tax, destined to replace all others). The same is true of the estate tax (either they shouldn't be taxed at all or should be taxed at 100 percent). In my view, it is urgent to lower the temperature of the debate and give each argument and each type of tax its due. A capital tax is useful, but it cannot replace all other taxes.
18. The same is true of an unemployed worker who has to continue paying a high property tax (especially when mortgage payments are not deductible). The consequences for overindebted households can be dramatic.
19. This compromise depends on the respective importance of individual incentives and random shocks in determining the return on capital. In some cases it may be preferable to tax capital income less heavily than labor income (and to rely primarily on a tax on the capital stock), while in others it might make sense to tax capital income more heavily (as was the case in Britain and the United States be-

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- fore 1980, no doubt because capital income was seen as particularly arbitrary). See Thomas Piketty and Emmanuel Saez, *A Theory of Optimal Capital Taxation*, NBER Working Paper 17989 (April 2012); a shorter version is available as “A Theory of Optimal Inheritance Taxation,” *Econometrica* 81, no. 5 (September 2013): 1851–86.
20. This is because the capitalized value of the inheritance over the lifetime of the recipient is not known at the moment of transmission. When a Paris apartment worth 100,000 francs in 1972 passed to an heir, no one knew that the property would be worth a million euros in 2013 and afford a saving on rent of more than 40,000 euros a year. Rather than tax the inheritance heavily in 1972, it is more efficient to assess a smaller inheritance tax but to requirement payment of an annual property tax, a tax on rent, and perhaps a wealth tax as the value of the property and its return increase over time.
 21. See Piketty and Saez, “Theory of Optimal Capital Taxation”; see also the online technical appendix.
 22. See Figure 14.2
 23. For example, on real estate worth 500,000 euros, the annual tax would be between 2,500 and 5,000 euros, and the rental value of the property would be about 20,000 euros a year. By construction, a 4–5 percent annual tax on all capital would consume nearly all of capital’s share of national income, which seems neither just nor realistic, particularly since there are already taxes on capital income.
 24. About 2.5 percent of the adult population of Europe possessed fortunes above 1 million euros in 2013, and about 0.2 percent above 5 million. The annual revenue from the proposed tax would be about 300 billion euros on a GDP of nearly 15 trillion. See the online technical appendix and Supplemental Table S5.1, available online, for a detailed estimate and a simple simulator with which one can estimate the number of taxpayers and the amount of revenue associated with other possible tax schedules.
 25. The top centile currently owns about 25 percent of total wealth, or about 125 percent of European GDP. The wealthiest 2.5 percent own nearly 40 percent of total wealth, or about 200 percent of European GDP. Hence it is no surprise that a tax with marginal rates of 1 or 2 percent would bring in about two points of GDP. Revenues would be even higher if these rates applied to all wealth and not just to the fractions over the thresholds.
 26. The French wealth tax, called the “solidarity tax on wealth,” (impôt de solidarité sur la fortune, or ISF), applies today to taxable wealth above 1.3 million euros (after a deduction of 30 percent on the primary residence), with rates ranging from 0.7 to 1.5 percent on the highest bracket (over 10 million euros). Allowing for deductions and exemptions, the tax generates revenues worth less than 0.5 percent of GDP. In theory, an asset is called a business asset if the owner is active in the associated business. In practice, this condition is rather vague and easily circumvented, especially since additional exemptions have been added over the years (such as “stockholder agreements,” which allow for partial or total exemptions if a

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group of stockholders agrees to maintain its investment for a certain period of time). According to the available data, the wealthiest individuals in France largely avoid paying the wealth tax. The tax authorities publish very few detailed statistics for each tax bracket (much fewer, for example, than in the case of the inheritance tax from the early twentieth century to the 1950s); this makes the whole operation even more opaque. See the online technical appendix.

27. See esp. Chapter 5, Figures 5.4 and following.
28. The progressive capital tax would then bring in 3–4 percent of GDP, of which 1 or 2 points would come from the property tax replacement. See the online technical appendix.
29. For example, to justify the recent decrease of the top wealth tax rate in France from 1.8 to 1.5 percent.
30. See P. Judet de la Combe, “Le jour où Solon a aboli la dette des Athéniens,” *Libération*, May 31, 2010.
31. In fact, as I have shown, capital in the form of land included improvements to the land, increasingly so over the years, so that in the long run landed capital was not very different from other forms of accumulable capital. Still, accumulation of landed capital was subject to certain natural limits, and its predominance implied that the economy could only grow very slowly.
32. This does not mean that other “stakeholders” (including workers, collectivities, associations, etc.) should be denied the means to influence investment decisions by granting them appropriate voting rights. Here, financial transparency can play a key role. I come back to this in the next chapter.
33. The optimal rate of the capital tax will of course depend on the gap between the return on capital, r , and the growth rate, g , with an eye to limiting the effect of $r > g$. For example, under certain hypotheses, the optimal inheritance tax rate is given by the formula $t = 1 - G/R$, where G is the generational growth rate and R the generational return on capital (so that the tax approaches 100 percent when growth is extremely small relative to return on capital, and approaches 0 percent when the growth rate is close to the return on capital). In general, however, things are more complex, because the ideal system requires a progressive annual tax on capital. The principal optimal tax formulas are presented and explained in the online technical appendix (but only in order to clarify the terms of debate, not to provide ready-made solutions, since many forces are at work and it is difficult to evaluate the effect of each with any precision).
34. Thomas Paine, in his pamphlet *Agrarian Justice* (1795), proposed a 10 percent inheritance tax (which in his view corresponded to the “unaccumulated” portion of the estate, whereas the “accumulated” portion was not to be taxed at all, even if it dated back several generations). Certain “national heredity tax” proposals during the French Revolution were more radical. After much debate, however, the tax on direct line transmissions was set at no more than 2 percent. On these debates and proposals, see the online technical appendix.

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35. Despite much discussion and numerous proposals in the United States and Britain, especially in the 1960s and again in the early 2000s. See the online technical appendix.
36. This design flaw stemmed from the fact that these capital taxes originated in the nineteenth century, when inflation was insignificant or nonexistent and it was deemed sufficient to reassess asset values every ten or fifteen years (for real estate) or to base values on actual transactions (which was often done for financial assets). This system of assessment was profoundly disrupted by the inflation of 1914–1945 and was never made to work properly in a world of substantial permanent inflation.
37. On the history of the German capital tax, from its creation in Prussia to its suspension in 1997 (the law was not formally repealed), see Fabien Dell, *L'Allemagne inégale*, PhD diss., Paris School of Economics, 2008. On the Swedish capital tax, created in 1947 (but which actually existed as a supplementary tax on capital income since the 1910s) and abolished in 2007, see the previously cited work of Ohlsson and Waldenström and the references given in the appendix. The rates of these taxes generally remained under 1.5–2 percent on the largest fortunes, with a peak in Sweden of 4 percent in 1983 (which applied only to assessed values largely unrelated to market values). Apart from the degeneration of the tax base, which also affected the estate tax in both countries, the perception of fiscal competition also played a role in Sweden, where the estate tax was abolished in 2005. This episode, at odds with Sweden's egalitarian values, is a good example of the growing inability of smaller countries to maintain an independent fiscal policy.
38. The wealth tax (on large fortunes) was introduced in France in 1981, abolished in 1986, and then reintroduced in 1988 as the "solidarity tax on wealth." Market values can change abruptly, and this can seem to introduce an element of arbitrariness into the wealth tax, but they are the only objective and universally acceptable basis for such a tax. Nevertheless, rates and tax brackets must be adjusted regularly, and care must be taken not to allow receipts to rise automatically with real estate prices, for this can provoke tax revolts, as illustrated by the famous Proposition 13 adopted in California in 1978 to limit rising property taxes.
39. The Spanish tax is assessed on fortunes greater than 700,000 euros in taxable assets (with a deduction of 300,000 euros for the principal residence), and the highest rate is 2.5 percent (2.75 percent in Catalonia). There is also an annual capital tax in Switzerland, with relatively low rates (less than 1 percent) due to competition among cantons.
40. Or to prevent a foreign competitor from developing (the destruction of the nascent Indian textile industry by the British colonizer in the early nineteenth century is etched into the memory of Indians). This can have lasting consequences.
41. This is all the more astonishing given that the rare estimates of the economic gains due to financial integration suggest a rather modest global gain (without even allowing for the negative effects on inequality and instability, which these

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- studies ignore). See Pierre-Olivier Gourinchas and Olivier Jeanne, “The Elusive Gains from International Financial Integration,” *Review of Economic Studies* 73, no. 3 (2006): 715–41. Note that the IMF’s position on automatic transmission of information has been vague and variable: the principle is approved, the better to torpedo its concrete application on the basis of rather unconvincing technical arguments.
42. The comparison that one sees most often in the press sets the average wealth of the 535 members of the US House of Representatives (based on statements collected by the Center for Responsible Politics) against the average wealth of the seventy richest members of the Chinese People’s Assembly. The average net worth of the US House members is “only” \$15 million, compared with more than \$1 billion for the People’s Assembly members (according to the Hurun Report 2012, a *Forbes*-style ranking of Chinese fortunes based on a methodology that is not very clear). Given the relative population of the two countries, it would be more reasonable to compare the average wealth of all three thousand members of the Chinese Assembly (for which no estimate seems to be available). In any case, it appears that being elected to the Chinese Assembly is mainly an honorific post for these billionaires (who do not function as legislators). Perhaps it would be better to compare them to the seventy wealthiest US political donors.
 43. See N. Qian and Thomas Piketty, “Income Inequality and Progressive Income Taxation in China and India: 1986–2015,” *American Economic Journal: Applied Economics* 1, no. 2 (April 2009): 53–63.
 44. For a very long-run perspective, arguing that Europe long derived an advantage from its political fragmentation (because interstate competition spurred innovation, especially in military technology) before it become a handicap with respect to China, see Jean-Laurent Rosenthal and R. Bin Wong, *Before and Beyond Divergence: The Politics of Economic Change in China and Europe* (Cambridge, MA: Harvard University Press, 2011).
 45. See the online technical appendix.
 46. In the period 2000–2010, the rate of permanent integration (expressed as a percentage of the population of the receiving country) attained 0.6–0.7 percent a year in several European countries (Italy, Spain, Sweden, and Britain), compared with 0.4 percent in the United States and 0.2–0.3 percent in France and Germany. See the online technical appendix. Since the crisis, some of these flows have already begun to turn around, especially between southern Europe and Germany. Taken as a whole, permanent immigration in Europe was fairly close to North American levels in 2000–2010. The birthrate remains considerably higher in North America, however.

16. *The Question of the Public Debt*

1. See in particular Table 3.1.
2. If we count assets owned by European households in tax havens, then Europe’s net asset position vis-à-vis the rest of the world becomes significantly positive: Eu-

- ropean households own the equivalent of all that there is to own in Europe plus a part of the rest of the world. See Figure 12.6.
3. Together with the proceeds of the sale of public financial assets (which no longer amount to much compared with nonfinancial assets). See Chapters 3–5 and the online technical appendix.
 4. The elimination of interest payments on the debt would make it possible to reduce taxes and/or finance new investments, especially in education (see below).
 5. For the equivalence to be complete, wealth would have to be taxed in a manner consistent with the location of real estate and financial assets (including sovereign bonds issued in Europe) and not simply based on the residence of the owners. I will come back to this point later.
 6. I will come back later to the question of the optimal level of long-term public debt, which cannot be resolved independently of the question of the level of public and private capital accumulation.
 7. Other tax schedules can be simulated with the aid of Supplemental Table S15.1, available online.
 8. See Chapter 10.
 9. On the redemption fund, see German Council of Economic Experts, *Annual Report 2011* (November 2011); *The European Redemption Pact: Questions and Answers* (January 2012). Technically, the two ideas can be perfectly complementary. Politically and symbolically, however, it is possible that the notion of “redemptions” (which connotes long and shared suffering by the entire population) may not sit well with the progressive capital tax, and the word “redemption” may be ill chosen.
 10. In addition to debt reduction through inflation, a major part of Germany’s debt was simply canceled by the Allies after World War II. (More precisely, repayment was postponed until an eventual German reunification, but it has not been repaid now that reunification has occurred.) According to calculations by the German historian Albrecht Ritschl, the amounts would be quite substantial if recapitalized at a reasonable rate. Some of this debt reflects occupation fees levied on Greece during the German occupation, which has led to endless and largely irreconcilable controversy. This further complicates today’s attempts to impose a pure logic of austerity and debt repayment. See Albrecht Ritschl, “Does Germany Owe Greece a Debt? The European Debt Crisis in Historical Perspective,” paper given at the OeNB 40th Economics Conference, Vienna (London School of Economics, 2012).
 11. If GDP grows 2 percent a year and debt 1 percent a year (assuming that one starts with a debt close to GDP), then the debt-to-GDP ratio will decrease by about 1 percent a year.
 12. The special one-time or ten-year tax on capital described above might be thought of as a way of applying primary surplus to debt reduction. The difference is that the tax would be a new resource that would not burden the majority of the population and not interfere with the rest of the government’s budget. In practice,

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there is a continuum of points involving various proportions of each solution (capital tax, inflation, austerity): everything depends on the dosage and the way the burdens of adjustment are shared among different social groups. The capital tax puts most of the burden on the very wealthy, whereas austerity policies generally aim to spare them.

13. Savings from the 1920s were essentially wiped out by the stock market crash. Still, the inflation of 1945–1948 was an additional shock. The response was the “old-age minimum” (created in 1956) and the advent of a PAYGO pension system (which was created in 1945 but further developed subsequently).
14. There are theoretical models based on this idea. See the online technical appendix.
15. See in particular the results presented in Chapter 12.
16. The same would be true in case of a breakup of the Eurozone. It is always possible to reduce public debt by printing money and generating inflation, but it is hard to control the distributive consequences of such a crisis, whether with the euro, the franc, the mark, or the lira.
17. An often-cited historical example is the slight deflation (decrease of prices and wages) seen in the industrialized countries in the late nineteenth century. This deflation was resented by both employers and workers, who seemed to want to wait until other prices and wages fell before accepting decreases in the prices and wages that affected them directly. This resistance to wage and price adjustments is sometimes referred to as “nominal rigidity.” The most important argument in favor of low but positive inflation (typically 2 percent) is that it allows for easier adjustment of relative wages and prices than zero or negative inflation.
18. The classic theory of Spanish decline blames gold and silver for a certain laxity of governance.
19. Milton Friedman and Anna J. Schwartz, *A Monetary History of the United States, 1857–1960* (Princeton: Princeton University Press, 1963).
20. Note that there is no such thing as a “money printing press” in the following sense: when a central bank creates money in order to lend it to the government, the loan is recorded on the books of the central bank. This happens even in the most chaotic of times, as in France in 1944–1948. The money is not simply given as a gift. Again, everything depends on what happens next: if the money creation increases inflation, substantial redistribution of wealth can occur (for instance, the real value of the public debt can be reduced dramatically, to the detriment of private nominal assets). The overall effect on national income and capital depends on the impact of policy on the country’s overall level of economic activity. It can in theory be either positive or negative, just as loans to private actors can be. Central banks redistribute monetary wealth, but they do not have the ability to create new wealth directly.
21. Conversely, the interest rates demanded of countries deemed less solid rose to extremely high levels in 2011–2012 (6–7 percent in Italy and Spain and 15 percent in Greece). This is an indication that investors are skittish and uncertain about the immediate future.

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22. The sum of gross financial assets and liabilities is even higher, since it amounts to ten to twenty years of GDP in most of the developed countries (see Chapter 5). The central banks thus hold only a few percent of the total assets and liabilities of the rich countries. The balance sheets of the various central banks are published online on a weekly or monthly basis. The amount of each type of asset and liability on the balance sheet is known in aggregate (but is not broken down by recipient of central bank loans). Notes and specie represent only a small part of the balance sheet (generally about 2 percent of GDP), and most of the rest consists purely of bookkeeping entries, as is the case for the bank accounts of households, corporations, and governments. In the past, central bank balance sheets were sometimes as large as 90–100 percent of GDP (for example, in France in 1944–1945, after which the balance sheet was reduced to nothing by inflation). In the summer of 2013, the balance sheet of the Bank of Japan was close to 40 percent of GDP. For historical series of the balance sheets of the main central banks, see the online technical appendix. Examination of these balance sheets is instructive and shows that they are still a long way from the record levels of the past. Furthermore, inflation depends on many other forces, especially international wage and price competition, which is currently damping down inflationary tendencies while driving asset prices higher.
23. As noted in the previous chapter, discussions about possible changes to European rules governing the sharing of bank data have only just begun in 2013 and are a long way from bearing fruit.
24. In particular, a steeply progressive tax requires information on all assets held by a single individual in different accounts and at different banks (ideally not just in Cyprus but throughout the European Union). The advantage of a less progressive tax was that it could be applied to each bank individually.
25. In France, the two hundred largest shareholders in the Banque de France were statutorily entitled to a central role in the governance of the bank from 1803 to 1936 and thus were empowered to determine the monetary policy of France. The Popular Front challenged this status quo by changing the rules to allow the government to name bank governors and subgovernors who were not shareholders. In 1945 the bank was nationalized. Since then, the Banque de France no longer has private shareholders and is a purely public institution, like most other central banks throughout the world.
26. A key moment in the Greek crisis was the ECB's announcement in December 2009 that it would no longer accept Greek bonds as collateral if Greece was downgraded by the bond rating agencies (even though nothing in its statutes obliged it to do so).
27. Another, more technical limitation of the “redemption fund” is that given the magnitude of the “rollover” (much of the outstanding debt comes due within a few years and must be rolled over regularly, especially in Italy), the limit of 60 percent of GDP will be reached within a few years, hence eventually all public debt will have to be mutualized.

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28. The budgetary parliament might consist of fifty or so members from each of the large Eurozone countries, prorated by population. Members might be chosen from the financial and social affairs committees of the national parliaments or in some other fashion. The new European treaty adopted in 2012 provides for a “conference of national parliaments,” but this is a purely consultative body with no power of its own and a fortiori no common debt.
29. The official version is that the virtually flat tax on deposits was adopted at the request of the Cypriot president, who allegedly wanted to tax small depositors heavily in order to prevent large depositors from fleeing. No doubt there is some truth to this: the crisis illustrates the predicament that small countries face in a globalized economy: to carve out a niche for themselves, they may be prepared to engage in ruthless tax competition in order to attract capital, even from the most disreputable sources. The problem is that we will never know the whole truth, since all the negotiations took place behind closed doors.
30. The usual explanation is that French leaders remain traumatized by their defeat in the 2005 referendum on the European Constitutional Treaty. The argument is not totally convincing, because that treaty, whose main provisions were later adopted without approval by referendum, contained no important democratic innovation and gave all power to the council of heads of state and ministers, which simply ratifies Europe’s current state of impotence. It may be that France’s presidential political culture explains why reflection about European political union is less advanced in France than in Germany or Italy.
31. Under François Hollande, the French government has been rhetorically in favor of mutualizing European debts but has made no specific proposal, pretending to believe that every country can continue to decide on its own how much debt it wishes to take on, which is impossible. Mutualization implies that there needs to be a vote on the total size of the debt. Each country could maintain its own debt, but its size would need to be modest, like state and municipal debts in the United States. Logically, the president of the Bundesbank regularly issues statements to the media that a credit card cannot be shared without agreement about how much can be spent in total.
32. Progressive income and capital taxes are more satisfactory than corporate income taxes because they allow adjustment of the tax rate in accordance with the income or capital of each taxpayer, whereas the corporate tax is levied on all corporate profits at the same level, affecting large and small shareholders alike.
33. To believe the statements of the managers of companies like Google, their reasoning is more or less as follows: “We contribute far more wealth to society than our profits and salaries suggest, so it is perfectly reasonable for us to pay low taxes.” Indeed, if a company or individual contributes marginal well-being to the rest of the economy greater than the price it charges for its products, then it is perfectly legitimate for it to pay less in tax or even to receive a subsidy (economists refer to this as a positive externality). The problem, obviously, is that it is in everyone’s interest to claim that he or she contributes a large positive externality to the rest of

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- the world. Google has not of course offered the slightest evidence to prove that it actually does make such a contribution. In any case, it is obvious that it is not easy to manage a society in which each individual can set his or her own tax rate in this way.
34. There was a recent proposal to pay international organizations the proceeds of a global wealth tax. Such a tax would become independent of nationality and could become a way to protect the right to multinationality. See Patrick Weil, “Let Them Eat Less Cake: An International Tax on the Wealthiest Citizens of the World,” *Policy Network*, May 26, 2011.
 35. This conclusion is similar to that of Dani Rodrik, who argues that the nation-state, democracy, and globalization are an unstable trio (one of the three must give way before the other two, at least to a certain extent). See Dani Rodrik, *The Globalization Paradox: Democracy and the Future of the World Economy* (New York: Norton, 2011).
 36. The system of “allowance for corporate equity” adopted in Belgium in 2006 authorizes the deduction from taxable corporate profits of an amount equal to the “normal” return on equity. This deduction is said to be the equivalent of the deduction of interest on corporate debt and is supposed to equalize the tax status of debt and equity. But Germany and more recently France have taken a different take: limiting interest deductions. Some participants in this debate, such as the IMF and to a certain extent the European Commission, claim that the two solutions are equivalent, although in fact they are not: if one deducts the “normal” return on both debt and equity, it is highly likely that the corporate tax will simply disappear.
 37. In particular, taxing different types of consumption goods at different rates allows for only crude targeting of the consumption tax by income class. The main reason why European governments are currently so fond of value-added taxes is that this type of tax allows for de facto taxation of imported goods and small-scale competitive devaluations. This is of course a zero-sum game: the competitive advantage vanishes if other countries do the same. It is one symptom of a monetary union with a low level of international cooperation. The other standard justification of a consumption tax relies on the idea of encouraging investment, but the conceptual basis of this approach is not clear (especially in periods when the capital/income ration is relatively high).
 38. The purpose of the fiscal transactions tax is to decrease the number of very high-frequency financial transactions, which is no doubt a good thing. By definition, however, the tax will not raise much revenue, because its purpose is to dry up its source. Estimates of potential revenues are often optimistic. They cannot be much more than 0.5 percent of GDP, which is a good thing, because the tax cannot target different levels of individual incomes or wealth. See the online technical appendix.
 39. See Figures 10.9–11. To evaluate the golden rule, one must use the pretax rate of return on capital (supposed to be equal to the marginal productivity of capital).
 40. The original article, written with a certain ironic distance in the form of a fable, is worth rereading: Edmund Phelps, “The Golden Rule of Accumulation: A Fable for Growthmen,” *American Economic Review* 51, no. 4 (September 1961): 638–43.

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A similar idea, expressed less clearly and without allusion to the golden rule, can be found in Maurice Allais's *Economie et intérêt* (Paris: Librairie des Publications Officielles, 1947) and in articles by Von Neumann (1945) and Malinvaud (1953). Note that all this work (including Phelps's article) is purely theoretical and does not discuss what level of accumulation would be required to make r equal to g . See the online technical appendix.

41. Capital's share is given by $\alpha = r \times \beta$. In the long run, $\beta = s/g$, so $\alpha = s \times r/g$. It follows that $\alpha = s$ if $r = g$, and $\alpha > s$ if and only if $r > g$. See the online technical appendix.
42. The reasons why the golden rule establishes an upper limit are explained more precisely in the online technical appendix. The essential intuition is the following. Beyond the level of capital described by the golden rule, that is, where the return on capital sinks below the growth rate, capital's long-run share is lower than the savings rate. This is absurd in social terms, since it would take more to maintain the capital stock at this level than the capital returns. This type of "dynamic inefficiency" can occur if individuals save without worrying about the return: for example, if they are saving for old age and their life expectancy is sufficiently long. In that case, the efficient policy is for the state to reduce the capital stock, for example, by issuing public debt (potentially in large amounts), thus de facto replacing a capitalized pension system by a PAYGO system. This interesting theoretical policy never seems to occur in practice, however: in all known societies, the average return on capital is always greater than the growth rate.
43. In practice, a tax on capital (or public ownership) can ensure that the portion of national income going to income on private capital (after taxes) is less than the savings rate without needing to accumulate so much. This was the postwar social-democratic ideal: profits should finance investment, not the high life of stockholders. As the German chancellor Helmut Schmidt said, "Today's profits are tomorrow's investments and the day after tomorrow's jobs." Capital and labor work hand in hand. But it is important to understand that this depends on institutions such as taxes and public ownership (unless we imagine unprecedented levels of accumulation).
44. In a sense, the Soviet interpretation of the golden rule simply transferred to the collectivity the unlimited desire for accumulation attributed to the capitalist. In chapters 16 and 24 of *The General Theory of Employment, Interest, and Money* (1936), where Keynes discusses "the euthanasia of the rentier," he develops an idea close to that of "capital saturation": the rentier will be euthanized by accumulating so much capital that his return will disappear. But Keynes is not clear about how much this is (he does not mention $r = g$) and does not explicitly discuss public accumulation.
45. The mathematical solution to this problem is presented in the online technical appendix. To summarize, everything depends on what is commonly called the concavity of the utility function (using the formula $r = \theta + \gamma \times g$, previously discussed in Chapter 10 and sometimes called the "modified golden rule"). With infinite concavity, one assumes that future generations will not need a hundredth additional iPhone, and one leaves them no capital. At the opposite extreme, one

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- can go all the way to the golden rule, which may necessitate leaving them several dozen years of national income in capital. Infinite concavity is frequently associated with a Rawlsian social objective and may therefore seem tempting. The difficulty is that if one leaves no capital for the future, it is not at all certain that productivity growth will continue at the same pace. Because of this, the problem is largely undecidable, as perplexing for the economist as for the citizen.
46. In the most general sense, a “golden rule” is a moral imperative that defines people’s obligations to one another. It is often used in economics and politics to refer to simple rules defining the current population’s obligations to future generations. Unfortunately, there is no simple rule capable of definitively resolving this existential question, which must therefore be asked again and again.
 47. These figures were retained in the new treaty signed in 2012, which added a further objective of maintaining a “structural” deficit of less than 0.5 percent of GDP (the structural deficit corrects for effects of the business cycle), along with automatic sanctions if these commitments were not respected. Note that all deficit figures in European treaties refer to the secondary deficit (interest on the debt is included in expenditures).
 48. A deficit of 3 percent would allow a stable debt-to-GDP ratio of 60 percent if nominal GDP growth is 5 percent (e.g., 2 percent inflation and 3 percent real growth), in view of the formula $\beta = s/g$ applied to the public debt. But the argument is not very convincing (in particular, there is no real justification for such a nominal growth rate). See the online technical appendix.
 49. In the United States, the Supreme Court blocked several attempts to levy a federal income tax in the late nineteenth and early twentieth centuries and then blocked minimum wage legislation in the 1930s, while finding that slavery and, later, racial discrimination were perfectly compatible with basic constitutional rights for nearly two centuries. More recently, the French Constitutional Court has apparently come up with a theory of what maximum income tax rate is compatible with the Constitution: after a period of high-level legal deliberation known only to itself, the Court hesitated between 65 and 67 percent and wondered whether or not it should include the carbon tax.
 50. The problem is similar to that posed by the return on PAYGO retirement systems. As long as growth is robust and the fiscal base is expanding at a pace equal (or nearly equal) to that of interest on the debt, it is relatively easy to reduce the size of the public debt as a percentage of national income. Things are different when growth is slow: the debt becomes a burden that is difficult to shake. If we average over the period 1970–2010, we find that interest payments on the debt are far larger than the average primary deficit, which is close to zero in many countries, and notably in Italy, where the average interest payment on the debt attained the astronomical level of 7 percent of GDP over this period. See the online technical appendix and Supplemental Table S16.1, available online.
 51. If the issue is constitutionalized, however, it is not impossible that a solution such as a progressive tax on capital would be judged unconstitutional.

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52. On the way Stern and Nordhaus arrive at their preferred discount rates, see the online technical appendix. It is interesting that both men use the same “modified golden rule” I described earlier but reverse positions entirely when it comes to choosing the concavity of the social utility function. (Nordhaus makes a more Rawlsian choice than Stern in order to justify ascribing little weight to the preferences of future generations.) A logically more satisfactory procedure would introduce the fact that the substitutability of natural capital for other forms of wealth is far from infinite in the long run (as Roger Guesnerie and Thomas Sterner have done). In other words, if natural capital is destroyed, consuming fewer iPhones in the future will not be enough to repair the damage.
53. As noted, the current low interest rates on government debt are no doubt temporary and in any case somewhat misleading: some countries must pay very high rates, and it is unlikely that those that are borrowing today at under 1 percent will continue to enjoy such low rates for decades (analysis of the period 1970–2010 suggests that real interest rates on long-term public debt in the rich countries is around 3 percent; see the online technical appendix). Nevertheless, current low rates are a powerful economic argument in favor of public investment (at least as long as such rates last).
54. Over the last several decades, annual public investment (net of depreciation of public assets) in most rich countries has been about 1–1.5 percent of GDP. See the online technical appendix and Supplemental Table S16.1, available online.
55. Including tools such as the carbon tax, which increases the cost of energy consumption as a function of the associated emission of carbon dioxide (and not as a function of budget variations, which has generally been the logic of gasoline taxes). There is good reason to believe, however, that the price signal has less of an impact on emissions than public investment and changes to building codes (requiring thermal insulation, for example).
56. The idea that private property and the market allow (under certain conditions) for the coordination and efficient use of the talents and information possessed by millions of individuals is a classic that one finds in the work of Adam Smith, Friedrich Hayek, and Kenneth Arrow and Claude Debreu. The idea that voting is another efficient way of aggregating information (and more generally ideas, reflections, etc.) is also very old: it goes back to Condorcet. For recent research on this constructivist approach to political institutions and electoral systems, see the online technical appendix.
57. For example, it is important to be able to study where political officials from various countries stand in the wealth and income hierarchies (see previous chapters). Still, statistical summaries might suffice for the purpose; detailed individual data are generally not needed. As for establishing trust when there is no other way to do so: one of the first actions of the revolutionary assemblies of 1789–1790 was to compile a “compendium of pensions” that listed by name and amount the sums paid by the royal government to various individuals (including debt repayments, pensions to former officials, and outright favors). This sixteen-hundred-page book

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contained 23,000 names and listed detailed amounts (multiple sources of income were combined into a single line for each individual), the ministry involved, the age of the person, the final year of payment, the reasons for the payment, etc. It was published in April 1790. On this interesting document, see the online technical appendix.

58. This is due mainly to the fact that wages are generally aggregated in a single line with other intermediate inputs (that is, with purchases from other firms, which also remunerate both labor and capital). Hence published accounts never reveal the split between profits and wages, nor do they allow us to uncover possible abuses of intermediate consumption (which can be a way of augmenting the income of executives and/or stockholders). For the example of the Lonmin accounts and the Marikana mine, see the online technical appendix.
59. The exigent attitude toward democracy of a philosopher such as Jacques Rancière is indispensable here. See in particular his *La haine de la démocratie* (Paris: La Fabrique, 2005).

Conclusion

1. Note, too, that it is perfectly logical to think that an increase in the growth rate g would lead to an increase in the return on capital r and would therefore not necessarily reduce the gap $r - g$. See Chapter 10.
2. When one reads philosophers such as Jean-Paul Sartre, Louis Althusser, and Alain Badiou on their Marxist and/or communist commitments, one sometimes has the impression that questions of capital and class inequality are of only moderate interest to them and serve mainly as a pretext for jousts of a different nature entirely.

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