COPYRIGHT NOTICE:

Edited by Daron Acemoglu: Introduction to Modern Economic Growth

is published by Princeton University Press and copyrighted, © 2009, by Princeton University Press. All rights reserved. No part of this book may be reproduced in any form by any electronic or mechanical means (including photocopying, recording, or information storage and retrieval) without permission in writing from the publisher, except for reading and browsing via the World Wide Web. Users are not permitted to mount this file on any network servers.

Follow links for Class Use and other Permissions. For more information send email to: permissions@press.princeton.edu

Epilogue: Mechanics and Causes of Economic Growth

Instead of summarizing the models and ideas presented so far, I end with a brief discussion of what we have learned from the models in this book and how they offer a useful perspective on world growth and cross-country income differences. I then provide a quick overview of some of the many remaining questions, which are important to emphasize both as a measure of our ignorance and as potential topics for future research.

What Have We Learned?

Let us first summarize the most important aspects and takeaway lessons of our analysis.

Growth as the source of current income differences. At an empirical level, the investigation of economic growth is important not only for understanding the growth process, but also because the analysis of the sources of cross-country income differences today requires us to understand why some countries have grown rapidly over the past 200 years while others have not (Chapter 1).

The role of physical capital, human capital, and technology. Cross-country differences in economic performance and growth over time are related to physical capital, human capital, and technology. Part of our analysis has focused on the contributions of these factors to production and growth (Chapters 2 and 3). One conclusion that has emerged concerns the importance of technology in understanding both cross-country and over-time differences in economic performance. Here, technology refers to advances in techniques of production, advances in knowledge, and the general efficiency of the organization of production.

Endogenous investment decisions. While we can make empirical progress by taking cross-country differences in physical and human capital as given, we also need to endogenize these investment decisions to develop a more satisfactory understanding of the mechanics and the causes of income and growth differences across countries. A large part of the book has focused on understanding physical and human capital accumulation (Chapters 8–11). Investments in physical and human capital are forward-looking and depend on the rewards that individuals expect from their investments. Understanding differences in these investments is therefore intimately linked to understanding how reward structures—that is, the pecuniary

and nonpecuniary rewards and incentives for different activities—differ across societies and how individuals respond to differences in reward structures.

Endogenous technology. I have also emphasized throughout that technology should be thought of as endogenous, not as manna from heaven. There are good empirical and theoretical reasons for thinking that new technologies are created by profit-seeking individuals and firms through research, development, and tinkering. In addition, decisions to adopt new technologies are likely to be highly responsive to profit incentives. Since technology appears to be a prime driver of economic growth over time and a major factor in cross-country differences in economic performance, we must understand how technology responds to factor endowments, market structures, and rewards. Developing a conceptual framework that emphasizes the endogeneity of technology has been one of the major objectives of this book. The modeling of endogenous technology necessitates ideas and tools that are somewhat different from those involved in the modeling of physical and human capital investments. Three factors are particularly important. First, the fixed costs of creating new technologies combined with the nonrival nature of technology necessitates the use of models in which innovators have ex post (after innovation) monopoly power. The same might apply, though perhaps to a lesser degree, to firms that adopt new technologies. The presence of monopoly power changes the welfare properties of decentralized equilibria and creates a range of new interactions and externalities (Chapters 12 and 13 and Section 21.5 in Chapter 21). Second, the process of innovation is implicitly one of competition and creative destruction. The modeling of endogenous technology necessitates more detailed models of the industrial organization of innovation. These models shed light on the impact of market structure, competition, regulation, and IPR protection on innovation and technology adoption (Chapters 12 and 14). Third, endogenous technology implies that not only the aggregate rate of technological change but also the types of technologies that are developed will be responsive to rewards. Key factors influencing the types of technologies that societies develop are again reward structures and factor endowments. For example, changes in relative supplies of different factors are likely to affect which types of technologies will be developed and adopted (Chapter 15).

Linkages across societies and balanced growth at the world level. While endogenous technology and endogenous growth are major ingredients in our thinking about the process of economic growth in general and the history of world economic growth in particular, it is also important to recognize that most economies do not invent their own technologies but adopt them from the world technology frontier or adapt them from existing technologies (Chapter 18). In fact, the process of technology transfer across nations might be one of the reasons why, after the initial phase of industrialization, countries that have been part of the global economy have grown at broadly similar rates (Chapter 1). Therefore the modeling of cross-country income differences and the process of economic growth for a large part of the world requires a detailed analysis of technology diffusion and international economic linkages. Two topics deserve special attention in this context. The first is the contracting institutions supporting contracts between upstream and downstream firms, between firms and workers, and between firms and financial institutions. These institutional arrangements affect the amount of investment, the selection of entrepreneurs and firms, and the efficiency with which different tasks are allocated across firms and workers. There are marked differences in contracting institutions across societies, and these differences appear to be a major factor influencing technology adoption and diffusion in the world economy. Contracting institutions not only have a direct effect on technology and prosperity, but they also shape the internal organization of firms, which contributes to the efficiency of production and influences how innovative firms will be (Section 18.5 in Chapter 18). The second is international trading relationships. International trade not only generates static gains familiar to economists but also influences the innovation and growth process. The international division of labor and the product cycle are examples of

how international trading relationships help the process of technology diffusion and enhance the specialization of production (Chapter 19).

Takeoffs and failures. The past 200 years of world economic growth stand in stark contrast to the thousands of years before. Despite intermittent growth in some parts of the world during certain epochs, the world economy was largely stagnant until the end of the eighteenth century. This stagnation had multiple aspects. These included low productivity, high volatility in aggregate and individual outcomes, a largely rural and agricultural economy, and a Malthusian configuration in which increases in output were often accompanied by increases in population, thus having only a limited effect on per capita income. Another major aspect of stagnation has been the failed growth attempts: many societies grew for certain periods of time and then lapsed back into depressions and stagnation. This cycle changed at the end of the eighteenth century. We owe our prosperity today to the takeoff in economic activity, and especially in industrial activity, that started in Britain and Western Europe and spread to certain other parts of the world, most notably to Western European offshoots, such as the United States and Canada. The nations that are rich today are precisely those where this process of takeoff originated or those that were able to rapidly adopt and build on the technologies underlying this takeoff (Chapter 1). A study of current income differences across countries requires understanding why some countries failed to take advantage of the new technologies and production opportunities.

Structural changes and transformations. Modern economic growth and development are accompanied by a set of sweeping structural changes and transformations. These include changes in the composition of production and consumption (the shift from agriculture to industry and from industry to services), urbanization, financial development, changes in inequality of income and inequality of opportunity, the transformation of social and living arrangements, changes in the internal organization of firms, and the demographic transition. While the process of economic development is multifaceted, much of its essence lies in the structural transformation of the economy and the society at large (Section 17.6 in Chapter 17 and Chapters 20 and 21). Many of these transformations are interesting to study for their own sake. They are also important ingredients for sustained growth. Lack of structural transformation is not only a symptom of stagnation but is also often one of its causes. Societies may fail to take off and benefit from the available technology and investment opportunities, partly because they have not managed to undergo the requisite structural transformations and thus lack the type of financial relations, the appropriate skills, or the types of firms that are conducive to the adoption of new technologies.

Policy, institutions, and political economy. The reward structures faced by firms and individuals play a central role in shaping whether they undertake the investments in new technology and in human capital necessary for takeoff, industrialization, and economic growth. These reward structures are determined by policies and institutions. Policies and institutions also directly affect whether a society can embark on modern economic growth for a variety of interrelated reasons (Chapter 4). First, they directly determine the society's reward structure, thus shaping whether investments in physical and human capital and technological innovations are profitable. Second, they determine whether the infrastructure and contracting arrangements necessary for modern economic relations are present. For example, modern economic growth would be impossible in the absence of some degree of contract enforcement, the maintenance of law and order, and at least a minimum amount of investment in public infrastructure. Third, they influence and regulate the market structure, thus determining whether the forces of creative destruction are operational so that new and more efficient firms can replace less efficient incumbents. Finally, institutions and policies may sometimes (or perhaps often) block the adoption and use of new technologies to protect politically powerful incumbent producers or stabilize the established political regime. Thus to understand the process of modern economic growth, we need to study the institutional and policy choices that societies make. We then need to

investigate the political economy of growth, paying special attention to which individuals and groups will be the winners from economic growth and which the losers. When losers cannot be compensated and have sufficient political power, we may expect the political economy equilibrium to lead to policies and institutions that are not growth enhancing. The basic analysis of the political economy of growth generates insights about what types of distortionary policies may block growth; when these distortionary policies will be adopted; and how technology, market structure, and factor endowments interact with the incentives of the social groups in power to encourage or discourage economic growth (Chapter 22).

Endogenous political institutions. Policies and institutions are central to understanding the growth process over time and cross-country differences in economic performance. These social choices are in turn determined in the context of a society's political institutions. Democracies and dictatorships are likely to make different policy choices and create distinct types of reward structures. But political institutions themselves are not exogenous. They can change along the equilibrium path as a result of their own dynamics and of stimuli coming from changes in technology, trading opportunities, and factor endowments (Chapter 23). For a more complete understanding of world economic growth and the income differences today, we therefore need to study (1) how political institutions affect policies and economic institutions, thus shaping incentives for firms and workers; (2) how political institutions themselves change, especially when interacting with economic outcomes and technology; and (3) why political institutions and the associated economic institutions did not lead to sustained economic growth throughout history, why they enabled economic takeoff 200 years ago, and why in some countries they blocked the adoption and use of superior technologies and derailed the process of economic growth.

In this summary, I have focused on the ideas most relevant for examining the process of world economic growth and cross-country income differences we observe today. The focus in the book has been not only on ideas but also on careful mathematical modeling of these ideas to develop coherent and rigorous theoretical approaches. I do not repeat here the theoretical foundations of these ideas, which range from basic consumer, producer, and general equilibrium theory to dynamic models of accumulation, models of monopolistic competition, models of world equilibria, and dynamic models of political economy. But I emphasize again that a thorough study of the theoretical foundations of these ideas is necessary both to develop a satisfactory understanding of the main issues and to find the best way of making them empirically operational.

A Possible Perspective on Growth and Stagnation over the Past 200 Years

The previous section summarized the most important ideas highlighted in this book. I now discuss how some of these ideas might be useful in shedding light on the process of world economic growth and cross-country divergence that have motivated our investigation from the start. The central questions are:

1. Why did the world economy not experience sustained growth before 1800?
2. Why did economic takeoff start around 1800 and in Western Europe?
3. Why did some societies manage to benefit from the new technologies and organizational forms that emerged starting in 1800, while others steadfastly refused or failed to do so?

I now offer a narrative that provides some tentative answers to these three questions. While certain parts of the mechanisms I propose here have been investigated econometrically and other parts are supported by historical evidence, the reader should view this narrative as a first attempt at providing coherent answers to these central questions. Two aspects of these answers are noteworthy. First, they build on the theoretical insights that the models presented so far generate. Second, in the spirit of the discussion in Chapter 4, they link the proximate causes of economic phenomena to fundamental causes, and in particular to institutions. And here I take a shortcut. Although I emphasized in Chapter 23 that there are no perfect political institutions and that each set of different political arrangements is likely to favor some groups at the expense of others, I simplify the discussion in this part by making a core distinction between two sets of institutional arrangements, one less conducive to growth than the other one. The first, which I refer to as *authoritarian political systems*, encompasses absolutist monarchies, dictatorships, autocracies, and various types of oligarchies that concentrate power in the hands of a small minority and pursue economic policies that are favorable to the interests of this minority. Authoritarian systems often rely on some amount of repression, because they seek to maintain an unequal distribution of political power and economic benefits. They also adopt economic institutions and policies that protect incumbents and create rents for those who hold political power. The second set of institutions are *participatory regimes*. These regimes place constraints on rulers and politicians, thus preventing the absolutist tendencies in political systems, and give voice to new economic interests, so that a strict decoupling between political and economic power is avoided. Such regimes include constitutional monarchies (where broader sections of the society take part in economic and political decision making) and democracies (where political participation is greater than in nondemocratic regimes). The distinguishing feature of participatory regimes is that they provide voice and (economic and political) security to a broader cross section of society than do authoritarian regimes. As a result, they are more open to entry by new businesses and provide a more level playing field and better security of property rights to a relatively broad section of the society. Thus in some ways, the contrast between authoritarian political systems and participatory regimes is related to the contrast between the growth-promoting cluster of institutions and the growth-blocking, extractive institutions emphasized and illustrated in Chapter 4. The reader should note that many different terms could have been used instead of "authoritarian" and "participatory," and some details of the distinction may be arbitrary. More importantly, it should be borne in mind that even the most participatory regime involves an unequal distribution of political power, and those who have more political power can use the fiscal and political instruments of the state for their own benefits and for the detriment of the society at large. Why this type of behavior is sometimes successfully curtailed or limited is a question at the forefront of current research, and I do not dwell on it here.

Why Did the World Not Experience Sustained Growth before 1800?

While sustained growth is a recent phenomenon, growth and improvements in living standards certainly have occurred many times in the past. Human history is also full of major technological breakthroughs. Even before the Neolithic Revolution, many technological innovations increased the productivity of hunter-gatherers. The transition to farming after about 9000 B.C. is perhaps the most significant technological revolution of all times: it led to increased agricultural productivity and the development of socially and politically more complex societies. Archaeologists have also documented various instances of economic growth in premodern periods. Historians estimate that consumption per capita doubled during the great flowering of

ancient Greek society from 800 B.C. to 50 B.C. (Morris, 2004). Similar improvements in living standards were experienced by the Roman republic and empire after 400 B.C. (Hopkins, 1980) and also appear to have been experienced by pre-Columbian civilizations in South America, especially by the Olmec, the Maya, the Aztec, and even perhaps the Inca (Webster, 2002; Mann, 2004). Although data on these ancient growth experiences are limited, the available evidence suggests that the basic neoclassical model, in which growth relies mostly on physical capital accumulation, provides a good description of the developments in these ancient economies (see, e.g., Morris, 2004).

However, these growth experiences were qualitatively different from those that the world experienced after its economic takeoff starting in the late eighteenth and early nineteenth centuries. Four factors appear to have been particularly important and set these growth episodes apart from modern economic growth. First, earlier episodes were relatively short-lived or took place at a relatively slow pace.[1] In most cases, the initial spurt of growth soon crumbled for one reason or another, somehow reminiscent of the failed takeoffs in the model of Section 17.6 in Chapter 17. Secondly and relatedly, growth was never based on continuous technological innovations; thus it never resembled the technology-based growth described in Chapters 13–15. Third, in most cases economic institutions that would be necessary to support sustained growth did not develop. Financial relations were generally primitive, contracting institutions remained informal, markets were heavily regulated with various internal tariffs, and incomes and savings did not reach the levels necessary for the mass market and simultaneous investments in a range of activities to become profitable. Put differently, the structural transformations accompanying development discussed in Chapter 21 did not take place. Fourth (and arguably most important and the cause of the first three), all these episodes took place within the context of authoritarian political regimes. They were not broad-based growth experiences. Instead, this was elite-driven growth for the benefit of the elite that largely exploited existing comparative advantages. Thus it is not surprising that the improvements in living standards did not affect the entire society but only a minority.

Why did these growth episodes not turn into a process of takeoff, ultimately leading to sustained growth? My main answer is related to that offered in Section 23.3 in Chapter 23. Growth under authoritarian regimes is possible. Entrepreneurs and workers can become better at what they do, achieve a better division of labor, and improve the technologies they work with by tinkering and learning by doing. Moreover, those with political power and their allies do have the necessary security of property rights to undertake investments. And some technological breakthroughs can happen by chance. Nevertheless a distinguishing feature of growth under authoritarian institutions is that it protects the interests of the current elite. So in the final analysis, growth must always rely on existing techniques and production relationships. It will not unleash the process of creative destruction and the entry of new talent and new businesses necessary to carry a nation to the state of sustained growth. In addition, technological constraints may have also played a role. For example, the relatively rapid growth in the nineteenth century required skilled workers, and before the printing press was invented, it would have been prohibitively costly for a critical mass of workers to acquire the necessary skills. Although the progress of technological knowledge is not monotonic (and useful production techniques are sometimes forgotten), the technological know-how available to potential entrepreneurs at the end of the eighteenth century was undoubtedly greater than that available to potential entrepreneurs in Rome or ancient Greece.

---

1. For example, in ancient Greece, Morris (2004) estimates that income per capita doubled or at most tripled in the 500 years between 800 B.C. and 300 B.C., and this was largely caused by catch-up growth starting from unusually low levels in 800 B.C.

Let me next elaborate on the aspects of political economy that appear to be critical and provide a few examples to illustrate the limits to growth under authoritarian regimes. The available evidence shows that the Chinese empire was technologically innovative during many distinct phases of its history. Productivity in the Chinese economy, especially in the Yangtze Delta and other fertile lands, was high enough to support a high density of population. But the Chinese economy never came close to sustained growth. Authoritarian political institutions have regulated economic activity tightly for most of Chinese history. The society was hierarchical, with a clear distinction between the elite and the masses. This system did not allow free entry into business by new entrepreneurs who would adopt and exploit new technologies and unleash the powers of creative destruction. When prospects for economic growth conflicted with political stability, the elite opted for maintaining stability, even if this came at the expense of potential economic growth. Thus China tightly controlled overseas and internal trade, did not develop the broad-based property rights and contracting institutions necessary for modern economic growth, and did not allow an autonomous middle class to emerge as an economic and political force (Elvin, 1973; Mokyr, 1990; Wong, 1997).

The ancient Greek and Roman civilizations are often viewed as the first democratic societies. One might therefore be tempted to count them as participatory regimes that should have achieved sustained economic growth. But this is not necessarily the case. First, as noted above, participatory regimes do not guarantee sustained economic growth when other preconditions have not been met. But more importantly, these societies were democratic only in comparison to others at the time. Both societies were representative only for a small fraction of the population. Production relied on slavery and coercion. Moreover, despite certain democratic practices, there was a clear distinction between a small elite, which monopolized economic and political power, and the masses, which consisted of both free plebs and slaves. Economic growth in both ancient Greece and Rome did not rely on continuous innovation. Both societies managed to achieve high levels of productivity in agriculture but without changing the organization of production in a radical manner. Both societies benefited from their military superiority for a while, and challenges to their military power were also important factors in their decline.

The Ottoman Empire provides another example of a society that was successful for an extended period of time but without ever transitioning to sustained growth. The Ottoman Empire, especially during the fourteenth, fifteenth, and sixteenth centuries, achieved relative prosperity and military strength. Agricultural productivity was high in many parts of the empire, and military tribute contributed to state coffers and generated revenues to be distributed to parts of the population. But the state elite, who controlled decision making within the empire, never encouraged broad-based economic growth. There was no private property in land, trade was permitted as long as it was consistent with the state's objectives but was always tightly controlled, and any new technology that could destabilize the power of the state was blocked. Like China, Greece, and Rome, the Ottoman growth first tapered off and then turned into decline (Pamuk, 2004).

The final example I mention is the Spanish monarchy. By the beginning of the sixteenth century, the Spanish crown had achieved both political dominance over its own lands under Ferdinand and Isabella and control of a large overseas empire through its colonial enterprises. Many parts of greater Spain, including the lands of Aragon and the south that had been recently reconquered from the Moors, were already prosperous in the fifteenth century. The whole of Spain became much wealthier with the transfer of gold, silver, and other resources from the colonies in the sixteenth century. But this wealth did not translate into sustained growth. The colonial experiment was managed under a highly authoritarian regime set up by Ferdinand and Isabella, and the most lucrative businesses were allocated to the allies of the crown. The greater revenues generated from the colonies only helped to tighten the grip of the crown on the rest of the society and the economy. Instead of abating, absolutism increased. Trade and

industry remained highly regulated, and groups not directly allied to the crown were viewed suspiciously and discriminated against. The most extreme example of this, the persecution of Jews that had started under the Inquisition, continued and spilled over to other independent merchants. Subsequent to the transfer of wealth from the colonies, Spain experienced a very lengthy period of stagnation, with economic and political decline (Elliott, 1963).

It is also remarkable that in none of these cases did complementary economic institutions develop. Financial institutions remained rudimentary. The Roman Republic developed a precursor to the modern corporation and allowed some contracts between free citizens, but by and large economic prosperity was built on traditional economic activities that did not necessitate complex relationships among producers and between firms and workers. Consequently the structural transformations that accompany economic growth never took place in these societies. Life was largely rural, and social relations were dominated by the state and community enforcement. Perhaps more important, there was little investment in human capital, except for the elite for whom education was seldom a means to higher productivity. Without broad-based human capital and political rights, creative destruction becomes even more difficult as a large fraction of the population is barred from entrepreneurial activities. All of the cases discussed here confirm this expectation.

Overall, these cases illustrate that societies that encourage increases in the productivity of the elite in traditional activities can secure growth for a while. But they are unlikely to engender creative destruction. Growth goes hand-in-hand with the political domination of the elite and thus with entry barriers protecting the status and the power of the elite. In this light, the answer to the question of "why not before 1800" is twofold. First, no society before 1800 invested in human capital, allowed new firms to bring new technology, and generally unleashed the powers of creative destruction. This failure might have been partly due to the difficulty of undertaking broad-based human capital investments in societies without the printing press and with only limited communication technologies. But it was also related to the reward structures for and constraints on workers and firms. An important consequence of this pattern of growth is that no society experienced the sweeping structural transformations that are an essential part of modern economic growth (Chapter 21). Second, no society took steps toward sustained growth, because all these societies lived under authoritarian political regimes.

Why Did Economic Takeoff Start around 1800 and in Western Europe?

The division of labor (emphasized by Adam Smith) and capital accumulation always present growth opportunities to societies. Furthermore human ingenuity is strong enough to create room for major technological breakthroughs in almost any environment. Thus there is always a growth impetus in human societies (Jones, 1988). Nevertheless this impetus may only be latent because it exists in the context of a set of political (and economic) institutions. When these institutions do not encourage growth—when they do not provide the right kind of reward structure and so punish rather than reward innovations—we do not expect the growth impetus to lead to sustained growth. Even in such environments, economic growth is possible, and this is why China, Greece, Rome, and other empires experienced growth for part of their history. But this prosperity did not exploit the full growth impetus; instead, it took place in the context of political regimes that, by their nature, had to control the growth impetus, because this impetus would ultimately bring these regimes down.

West European growth starting in the late eighteenth century was different, because Western Europe underwent three important structural transformations starting in the late Middle Ages. These structural transformations created an environment in which the latent growth impetus could turn into an engine of sustained growth.

The first was the collapse of one of the pillars of the ancient regime, the decline of feudal relations in Western Europe. Starting in the thirteenth century and especially after the Black Death during the mid-fourteenth century, feudal economic relations crumbled in many parts of Western Europe. Serfs were freed from their feudal dues either by default (because the relationship collapsed) or by fleeing to the expanding city centers (Postan, 1966). This emancipation heralded the beginning of an important social transformation: urbanization and changes in social relations. But perhaps more importantly, it created a labor force ready to work at cheap wages in industrial and commercial activities. It also removed one of the greatest sources of conflict between existing elites and new entrepreneurs—competition in the labor market (Chapter 22). The decline of the feudal order further weakened the power base of the European authoritarian regimes (Pirenne, 1937).

The second structural transformation was related. With the decline in population in the fourteenth century, real incomes increased in much of Europe, and many cities created sufficiently large markets for merchants to seek new imports and for industrialists to seek new products. During the Middle Ages, a range of important technologies in metallurgy, armaments, agriculture, and basic industry (e.g., textiles), were already perfected (White, 1964; Mokyr, 1990). Thus the European economy had reached the technological maturity to act as a platform for entrepreneurial activity in a range of areas, and income levels were sufficient to encourage investment in physical capital and technology to spearhead new production relations.

The third and most important change was political. The late Middle Ages also witnessed the start of a political process that inexorably led to the collapse of absolutist monarchies and to the rise of constitutional regimes. The constitutional regimes that emerged in the sixteenth and seventeenth centuries in Western Europe were the first examples of participatory regimes, because they shifted political power to a large group of individuals that were previously outsiders to political power. This group included the gentry, small merchants, proto-industrialists, as well as overseas traders and financiers. These regimes then provided secure property rights and growth-enhancing institutions for a broad cross section of society. These institutional changes created the requisite environment for new investments and technological changes and the beginning of sustained growth, which would culminate in the Commercial Revolution in the Netherlands and Britain during the seventeenth century and in the British Industrial Revolution at the end of the eighteenth century. By the nineteenth century, industry and commerce had spread to much of Western Europe (see Chapter 4; North and Thomas, 1973).

It is noteworthy that constitutional monarchies were not democracies as we understand them today. There was no one-person one-vote principle, and the distinction between the rich and the poor was quite palpable. Nevertheless these regimes emerged as responses to the demands by the merchants and industrialists. More importantly, these constitutional regimes not only reformed the political institutions of Western Europe but undertook a series of economic reforms facilitating modern capitalist growth. Internal tariffs and regulations were lifted. Entry into domestic businesses and foreign trade was greatly facilitated. For example, the process of financial development in Britain began with the founding of the Bank of England and other financial reforms.

These constitutional regimes, which emerged first in Britain and the Netherlands and then in France and other parts of Western Europe, paved the way for sustained economic growth based on property rights for a broad cross section of society, contract enforcement, the rule of law, and free entry into existing and new business lines. According to the theoretical perspective developed in earlier chapters, these improved conditions should have led to greater investments in physical capital, human capital, and technology. This is indeed what happened, and the process of modern economic growth was launched. Economic relations now relied on new businesses investing in industry, commerce, and the formation of complex organizational forms and production relations. Growth did not immediately accelerate. Economic growth

was present but modest during the seventeenth and eighteenth centuries (Maddison, 2001). But these institutional changes laid the foundations for the more rapid growth that was soon to come. Financial institutions developed, the urban areas expanded further, new technologies were invented, and markets became the primary arena for transactions and competition (North and Thomas, 1973). By 1800, the process of technological change and investment had progressed so much as to be dubbed the "Industrial Revolution" (Ashton, 1969; Mokyr, 1993). The first phase of the Industrial Revolution was followed by the production of yet newer technologies, more complex organizations, greater reliance on skills and human capital in the production process, and increasing globalization of the world economy. By the second half of the nineteenth century, Western Europe had reached unprecedented growth levels.

Naturally, a complete answer to the question in the title of this subsection requires an explanation for why the constitutional regimes that were so important for modern economic growth emerged in Western Europe starting in the late sixteenth century and seventeenth century. These institutions had their roots in the late medieval aristocratic parliaments in Europe, but more importantly, they were the outcome of radical reform resulting from the change in the political balance of power in Europe starting in the sixteenth century (Ertman, 1997). The sixteenth century witnessed a major economic transformation of Europe, following the increase in international trade due to the discovery of the New World and the rounding of the Cape of Good Hope (Davis, 1973; Acemoglu, Johnson, and Robinson, 2005a). Together with increased overseas trade came greater commercial activity within Europe. These changes led to a modest increase in living standards, and more importantly, to greater economic and political power for a new group of merchants, traders, and industrialists. These new men were not the traditional allies of the European monarchies. They therefore demanded, and often were powerful enough to obtain, changes in political institutions that provided them with greater security of property rights and government action to help them in their economic endeavors. By this time, with the collapse of the feudal order, the foundations of the authoritarian regimes that were in place in the Middle Ages were already weak. Nevertheless the changes leading to the constitutional regimes did not come easy. The Dutch had to fight the Hapsburg monarchy to gain their independence as a republic. Britain had to endure its civil war and the Glorious Revolution. France had to go through the Revolution of 1789. But in all cases, the ancien regime gave way to more representative institutions, with greater checks on absolute power and greater participation by merchants, industrialists, and entrepreneurs. It was important that the social changes led to a new set of political institutions and not simply to concessions. This distinction is related to the theoretical ideas emphasized in Section 23.3 of Chapter 23: the nascent groups demanded long-term guarantees for the protection of their property rights and their participation in economic life. Such guarantees were most easily delivered by changes in political institutions, not by short-term concessions.

These changes created the set of political institutions that would then enable the emergence of the economic institutions mentioned above. The collapse of the authoritarian political regimes and the rise of the first participatory regimes then opened the way for modern economic growth.

Why Did Some Societies Manage to Benefit from New Technologies While Others Failed to Do So?

The economic takeoff started in Western Europe but quickly spread to certain other parts of the world. The chief importer of economic institutions and economic growth was the United States. The United States, founded by settler colonists who had just defeated the British

crown to gain their independence and set up a smallholder society, already had participatory political institutions. This was a society built by the people who would live in it, and they were particularly willing to create checks and balances to prevent the subsequent emergence of a strong political or economic elite. This environment turned out to be a perfect conduit for modern economic growth. The lack of a strong political and economic elite meant that a broad cross section of society could take part in economic activity, import technologies from Western Europe, and then build their own technologies to quickly become the major industrial power in the world (Galenson, 1996; Engerman and Sokoloff, 1997; Keyssar, 2000; Acemoglu, Johnson, and Robinson, 2002). In the context of this example, the importance of technology adoption from the world technology frontier is in line with the emphasis in Chapter 18, while the growth-promoting effects of a lack of elite creating entry barriers is consistent with the approach in Section 23.3 in Chapter 23.

Similar processes took place in other West European offshoots, for example, in Canada. Yet in other parts of the world, adoption of new technologies and the process of economic growth came as part of a movement toward defensive modernization. Japan started its economic and political modernization with the Meiji restoration (or perhaps even before), and a central element of this modernization effort was the importation of new technologies.

However these attitudes to new technologies were by no means universal. New technologies were not adopted, but resisted, in many parts of the world. This included most of Eastern Europe—for example, Russia and Austria-Hungary—where the existing land-based elites saw new technologies as a threat both to their economic interests (because they would lead to the end of the feudal relations that still continued in this part of Europe) and to their political interests, which relied on limiting the power of new merchants and slowing down the process of peasants migrating to cities to become the new working class (see Freudenberger, 1967, and Mosse, 1992, for evidence, and Chapter 22 for a theoretical perspective). Similarly, the previously prosperous plantation economies in the Caribbean had no interest in introducing new technologies and allowing free entry by entrepreneurs. These societies continued to rely on their agricultural staples. Industrialization, competition in free labor markets, and workers investing in their human capital were seen as potential threats to the economic and political powers of the elite. The newly independent nations in Latin America were also dominated by a political elite, which continued the tradition of the colonial elite and showed little interest in industrialization. Much of Southeast Asia, the Indian subcontinent, and almost all of sub-Saharan Africa were still West European colonies and were governed under authoritarian and repressive regimes (often as producers of raw materials for the rapidly industrializing Western European nations or as sources of tribute). Free labor markets, factor mobility, creative destruction, and new technologies did not feature in the colonial political trajectories of these countries (Chapter 4).

Thus the nineteenth century was only to see the industrialization of a few select places. By the twentieth century, however, more and more nations started importing the technologies that had been developed and used in Western Europe. This process of technology transfer pulled the countries integrated into in the global economy toward higher income levels (Chapter 19). But this growth episode did not benefit all countries. Many had to wait for their independence from their colonial masters, and even then, the end of colonialism led to a period of instability and infighting among would-be elites. Once some degree of political stability was achieved and economic institutions that encourage growth were put in place, growth started. For example, growth in Australia and New Zealand was followed by that in Hong Kong, by that in South Korea, then by the rest of Southeast Asia, and finally by India. In each of these cases, as emphasized in Chapters 20 and 21, growth went hand-in-hand with structural transformations. Once the structural transformations were under way, they facilitated further growth. Consistent with the picture in Chapters 18 and 19, societies integrated into the global economy started

importing technologies and achieved growth rates in line with the growth of the world technology frontier (and often exceeding those during their initial phase of catch-up). In most cases, this process meant growth for the new members of the global economy but not necessarily the disappearance of the income gap between these new members and the earlier industrializers.

Meanwhile many parts of the world continued to suffer political instability that discouraged investment in capital and new technology or even exhibited overt hostility to new technologies. These included parts of sub-Saharan Africa and, until recently, much of Central America. Returning to some of the examples discussed in Chapter 1, Nigeria and Guatemala failed to create incentives for their entrepreneurs or workers both during their colonial periods and after independence. Both these countries also experienced significant political instability and economically disastrous civil wars in the postwar era. Brazil managed to achieve some degree of growth, but it was mostly based on investment by large, heavily protected corporations and not on a sustained process of technological change and creative destruction (thus it was more similar to the oligarchic growth in terms of the model of Section 23.3 in Chapter 23). In these and other cases, policies that failed to provide secure property rights to new entrepreneurs and those that blocked the adoption of new technologies—as well as political instability and infighting among the elites—seem to have played an important role in the failure to join the world economy and its growth process. Overall, these areas fell behind the world average in the nineteenth century and continued to trail for most of the twentieth century. Many nations in sub-Saharan Africa, such as Congo, Sudan, and Zimbabwe, are still experiencing political turmoil and fail to offer even the most basic rights to their entrepreneurs and citizens. Consequently many are falling still further behind the world average.

Many Remaining Questions

The previous section provided a narrative emphasizing how technological changes transformed the world economy starting in the eighteenth century and how certain societies took advantage of these changes while others failed to do so. Parts of the story receive support from the data. The importance of industrialization to the initial takeoff is now well documented. There is a broad consensus that economic institutions protecting property rights and allowing for free entry and introduction of new technologies were important in the nineteenth century and continue to be important today in securing economic growth. There is also a general consensus that political instability, weak property rights, and lack of infrastructure are major impediments to growth in sub-Saharan Africa. Nevertheless the narrative here is speculative. These factors might be important, but they may not be the main explaination of the evolution of the world income distribution over the past 200 years. And as yet there is no consensus on the role of political institutions in this process.

Thus what I have presented here should be taken for what it is: a speculative answer that needs to be further investigated. My purpose in outlining it was not only that I suspect this answer has much truth to it but also to show how the various models developed in this book can help us better frame answers to fundamental questions of economic growth (and of economics and social sciences in general). I should add that further investigation of the causes of the world's takeoff into sustained growth and the failure of some nations to take advantage of this process is only one of the many remaining challenges. The political economy of growth is important because it enables us to ask and answer questions about the fundamental causes of economic growth. But many other aspects of the process of growth require further study. In some sense, the field of economic growth is one of the more mature areas in economics, and certainly within macroeconomics it is the area where there is broadest agreement on what types

of models are useful for the study of economic dynamics and for empirical analysis. And yet there is so much that we still do not know.

I now end by mentioning a few areas with great potential for further theoretical and empirical advances. First, although here I have largely focused on factors facilitating or preventing the adoption of technologies in less-developed nations, there is still much to be done to understand the pace of technological progress in frontier economies. Our models of endogenous technological change give us the basic framework for thinking about how profit incentives shape investments in new technologies. But we still know relatively little about the industrial organization of innovation, for example, on how market structure affects economic growth. Chapters 12 and 14 highlighted how different market structures may create different incentives for technological change. But most of our understanding of these issues is qualitative. For example, in the context of the economics of innovation, we lack a framework—similar to that used for the analysis of the effects of capital and labor income taxes and indirect taxes in public finance—which could be used to analyze the effects of various regulations, IPR policies, and anticompetitive laws on innovation and economic growth. Since the pace at which the world technology frontier progresses has a direct effect on the growth of many nations, even small improvements in the environment for innovation in advanced economies could have important dividends for the rest of the world.

In addition to the industrial organization of innovation, the contractual structure of innovation needs further study. We live in a complex society in which most firms are linked to others as suppliers or downstream customers, and most firms are connected to the rest of the economy indirectly through their relationship with financial markets. These relationships are mediated by various explicit and implicit contracts. Similarly, the employment relationship that underlies the productivity of most firms relies on contractual relations between employers and employees. We know that moral hazard and holdup problems occur in these contractual relationships. But how important are they for the process of economic growth? Can improvements in contracting institutions improve innovation and technological upgrading in frontier economies? Can they also facilitate technology transfer? These are basic, but as yet, unanswered questions. The contractual foundations of economic growth are still in their infancy and require much work.

The previous section emphasized how several economies started the growth process by importing technologies and thus integrating into the global economy. Today we live in an increasingly globalized and globalizing economy. But there is still much to understand about how technology is transferred from some firms to others and from advanced economies to less-developed ones. The models I presented in Chapter 19 emphasized the importance of human capital, barriers to technology adoption, issues of appropriate technology, and contracting problems. Nevertheless most of the models are still at the qualitative level, and we lack a framework that can make quantitative predictions about the pace of technology diffusion. We have also not yet incorporated many important notions related to technology transfer into our basic frameworks. These include, among others, ideas related to tacit knowledge, appropriate technology, the workings of the international division of labor, the role of international IPR protection, and the interaction between trade and technology diffusion.

The reader will have also noticed that the material presented in Chapter 21 is much less unified and perhaps more speculative than that in the rest of the book. Although some of this reflects the fact that I had to simplify a variety of models to be able to present them in a limited space, much of it is because we are far from a satisfactory framework for understanding the process of economic development and the structural transformations that it involves. Some aspects of these structural transformations, such as the increased importance of manufacturing and then services relative to agriculture, can be viewed as a by-product of economic growth. But other aspects of this process, including financial development, changes in contract enforcement

regimes, urbanization, and the amount and composition of human capital investments, may be facilitators or even preconditions for economic growth and development. Thus the lack of significant structural transformation might be an important factor in delaying or preventing economic growth. To understand these questions, we require models with stronger theoretical foundations, a systematic approach to these related issues, and a greater effort to link the models of economic development to the wealth of empirical evidence that the profession has now accumulated on economic behavior in less-developed economies.

Last but not least, given the narrative in the last section and the discussion in Chapters 4, 22, and 23, it comes as no surprise that I think many important insights about economic growth lie in political economy. But understanding politics is in many ways harder than understanding economics, because political relations are even more multifaceted. Although I believe that the political economy and growth literatures have made important advances in this area over the past decade or so, much remains to be done. The political economy of growth is in its infancy, and as we further investigate why societies make different collective choices, we will gain a better understanding of the process of economic growth.