

Introduction

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THE APPROACH OF a new millennium affords an opportunity to contemplate long-term trends. No phenomenon in economic history is more striking than the difference between the past three centuries and the several thousand years that preceded them. Throughout recorded human history, scientific and technological knowledge advanced by fits and starts. But in Europe, roughly three centuries ago, a marked acceleration in the application of science and technology to agriculture, industry, transportation, and other fields of economic endeavor began. This trend was accompanied by dramatic changes in standards of material well-being. The turning point in these relationships is commonly associated with the first industrial revolution, though there were antecedents.¹

The long-run consequences of those changes can be assessed by attempting to measure, however imperfectly, growth in the quantity of goods and services available to the average citizen—that is, growth in what economists call real income per capita.² For the

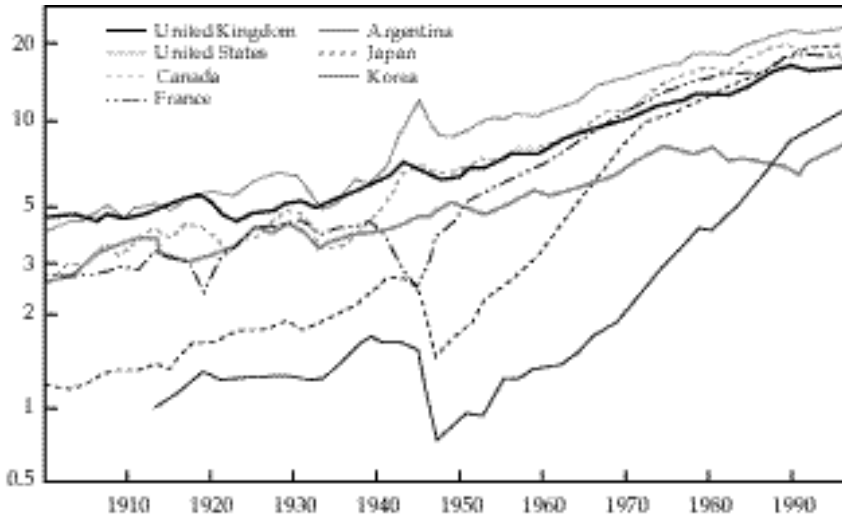
period between 1000 and 1700 A.D., David Landes estimates, real income per capita in western Europe roughly trebled. This trebling over 700 years implies an average 0.16 percent rate of annual increase. Between 1700 and 1750, the apparent growth rate rose to 0.4 percent. Then, during the next century and a half, it escalated to somewhere in the range of 1.2 to 1.5 percent a year. Whereas it had taken more than four centuries for the real income of an average citizen to double during the Middle Ages, the doubling period with a steady 1.4 percent annual growth rate was reduced to fifty years. As a consequence, the average British, Canadian, American, French, or Japanese citizen today enjoys a panoply of goods and services that would evoke wonder and envy from sixteenth-century European nobles.

As these transformations became evident, scholars sought with varying degrees of success to understand why they had happened and what principles underlay them. And now, as the millennium draws near, the question burns, Can continuing growth be sustained, and if so, at what rates and for how long?

Adding interest to such questions, historical and prospective, is the fact that diverse nations have had widely differing economic growth experiences. Figure 1-1 supplies an introductory perspective, showing how real gross domestic product per capita grew (and sometimes fell) during the twentieth century for seven prominent but representative nations—the United Kingdom, the United States, Canada, France, Japan, Argentina, and Korea. The vertical scale, measuring GDP per capita in constant 1990 purchasing parity dollars, is logarithmic, which means that growth at a constant rate is shown by a straight-line trend. The steeper the trend line, the higher the growth rate. At the turn of the century, the United Kingdom, leader of the first industrial revolution, had the highest real GDP per capita among major nations. The United Kingdom was overtaken by the United States for the first time in 1906, and then, after occasional reversals, the United States secured a persistent

Figure 1-1. GDP per Capita, Seven Nations, 1900–94

Thousand U.S. dollars, 1990 purchasing power parity



Source: Angus Maddison, *Monitoring the World Economy: 1880–1992* (Paris: Organization for Economic Cooperation and Development, 1995), appendix D.

lead. Japan's GDP per capita was one-fourth that of the United Kingdom in 1900. By growing faster than the United Kingdom and the United States, Japan closed some of the gap in the ensuing forty years and then, following the disastrous consequences of World War II, advanced extraordinarily rapidly after the war to move into near parity with the leading nations. Korea started even farther behind, but after World War II sustained even more rapid and persistent growth than Japan. Argentina began the century as one of the world's most prosperous nations but experienced relatively slow growth, falling back by 1994 to a GDP per capita level only half that of the United Kingdom.

From the tangle of graphic trajectories, table 1-1 extracts in numerical form estimates of the average real GDP per capita growth rates achieved by the seven nations over the full ninety-four years covered by figure 1-1 and also for two shorter intervals—the

Table 1-1. Average Annual Growth Rates of Real GDP, Selected Countries, 1900–94

Country	Percent		
	1900–94	1950–94	1972–94
United Kingdom	1.35	1.98	1.73
United States	1.82	1.95	1.61
Canada	2.02	2.18	1.63
France	1.96	2.81	1.70
Argentina	1.18	1.18	0.42
Japan	3.03	5.33	2.87
South Korea	3.01	5.80	6.93

Source: See figure 1-1.

forty-four years from 1950 to 1994, and the twenty-two years from 1972 to 1994.³

Growth rates during the twentieth century have for the most part exceeded those experienced during the first industrial revolution. A further acceleration of growth in the period after World War II is evident. Since the early 1970s, however, growth has been slower (except for South Korea), triggering widespread concern over the possibility of continued slow growth or even retardation in coming decades.⁴ The extraordinarily rapid growth rates of Korea and Japan and the persistently weak performance of Argentina stand out.

These are for the most part success stories, but there are also failures to tell about. Many nations, especially those in Africa, South America, and parts of Asia, have advanced only slowly and as a result have fallen ever farther behind the industrialized nations.

Since the onset of the first industrial revolution, economists have struggled to develop systematic explanations for the causes of growth and to understand the reasons why growth proceeds slowly at some times and in some nations, but rapidly in others. Widely varying theories have been propounded. During the past two decades, a “new growth theory” has taken the economics profes-

sion by storm.⁵ This book traces the evolution of economic thinking on the economic growth question and examines with particular care the roots of the “new” growth theories. Special emphasis is devoted to technological change, which occupies a key role in some theories of growth but is virtually absent in others.